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WheatGrower

WHEAT FACTS '88

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The Wheat Grower
Official Publication of the National Association of Wheat Growers

October 1988

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VICE PRESIDENT'S PERSPECTIVE

A Piece Of Good Advice

A piece of advice that I often got from my mother when I was growing up and encountering unfamiliar social situations was, "Just be yourself, and you'll get along fine!" Somehow, that advice was always comforting, because, after all, what else could I do?

But in that advice was also the message that sincerity is the best policy.

Sincerity is certainly the best policy on Capitol Hill. And that's what wheat growers bring with them when they visit their congressmen and senators in Washington, present testimony before congressional committees on behalf of the NAWG and keep in touch with their congressman's district office. In these ways, they are taking the opportunity to sincerely communicate to lawmakers what their needs and concerns are. And they have the opportunity to explain what the "real life" implications are for various policy options.

Your representatives in Congress count on you, their constituents, to help them do their jobs effectively. Writing good legislation in Congress or writing good regulations in the U.S. Department of Agriculture often is as much art as science. Even the most carefully crafted law or regulation can produce unintended, counterproductive results.

Politically active wheat growers are the best lobbyists for the industry. No one knows better than growers what's best for the wheat industry. So, having growers "tell it like it is" on the Hill has always been NAWG's most successful strategy for achieving the best policy results for the industry. For this reason, we've found that "Just be yourself" is pretty good advice for the grower making his way to the witness chair.

The NAWG's mission is to present wheat growers' opinions on a national basis as concisely and fairly to legislators as possible. The NAWG staff listens to growers' opinions on the issues of the day at board meetings and conventions, and then sees that growers' needs are taken into account as legislation is written and regulations drafted.

Wheat state legislators depend on the NAWG for an honest account of public opinion in wheat country. And they depend on the NAWG for a sincere appraisal of what needs to be done to fix the problems, an appraisal that neither overstates problems nor underestimates their importance.

Growers can play a large role in helping both the NAWG and the Congress to do their respective jobs. And the best help you can provide is to give an open, honest and sincere evaluation of what you feel will best serve the interests of your industry.

So, I guess Mom was right. Sincerity is the best policy—especially when it comes to politics.

Margie Williams is NAWG's Vice President for Public Affairs.

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WHEAT FACTS
1988

This special supplement is compiled by *The Wheat Grower.*

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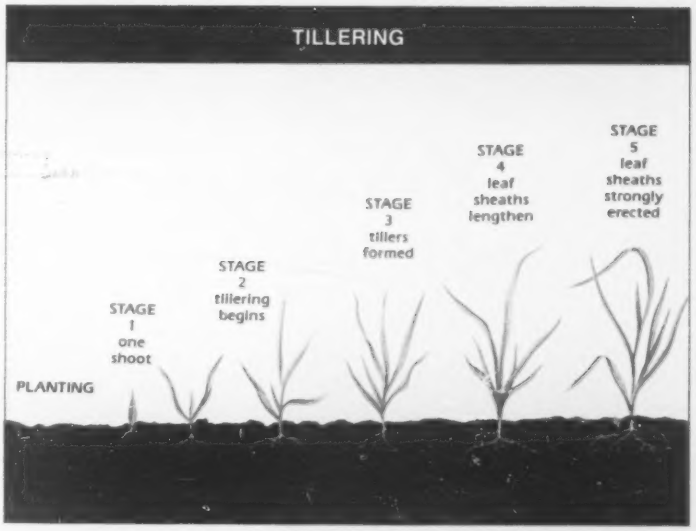
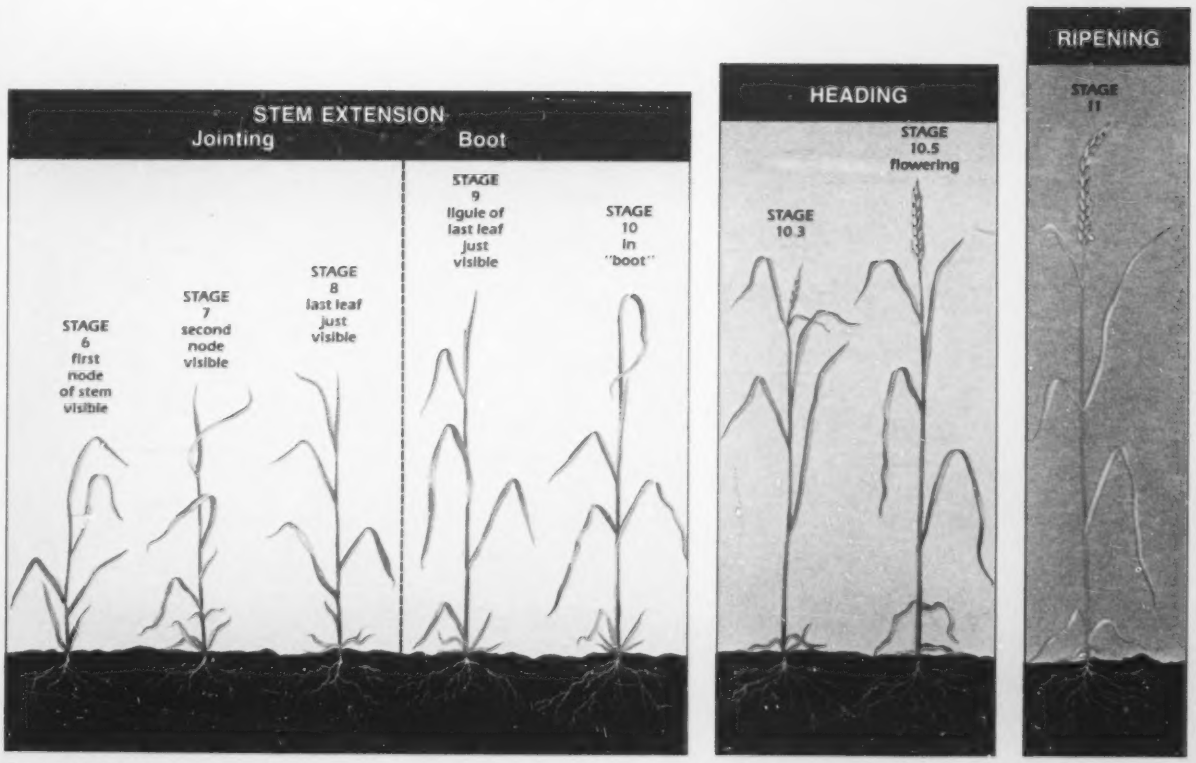
FEEKES' SCALE OF WHEAT DEVELOPMENT

Knowing the various stages of growth and development of a wheat crop enables growers to exercise better management of inputs by allowing these inputs to be used at the proper growth stage and not according to a calendar date.

Agronomists have developed the "Feekes' Scale," an objective measure of the growth and development of wheat plants, to help growers identify the optimum time to apply inputs.

This measuring system ranges from 1.0 (to designate emergence of the first seedling leaf) to 11.4 (to designate mature plants with hard grain).





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FIVE BASIC CLASSES OF WHEAT

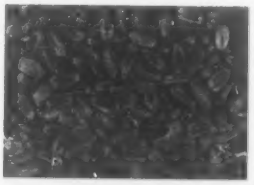
Wheat varieties grown in the United States are either "winter wheat" or "spring wheat," depending on the season each is planted. Winter wheat is sown in the fall and has some preliminary growth before cold weather arrives. The plants have a special gene that allows them to lie dormant through the winter. In the spring, they resume growth and grow rapidly until summertime harvest. Spring wheat, produced in northern states where winters are too severe for fall-sown wheat, is sown in the spring as soon as the ground is workable and grows continuously until harvest.

The many varieties of winter and spring wheat are grouped into five basic classes. The class each variety fits into is determined by the hardness, color and shape of its kernels, as well as by its planting time. Each class of wheat has its own similar family characteristics, especially as related to milling and to baking or other food use. The five basic classes are:

HARD RED WINTER: An important bread wheat. Accounts for a majority of the U.S. wheat crop. Produced in the Great Plains states, a large interior area extending from the Mississippi River west to the Rocky Mountains, and from the Dakotas and Montana down to Texas. Fall seeded. Wide range of protein content. Good milling and baking characteristics. No subclasses.

WHITE WHEAT: Used in the same ways as Soft Red Winter (for bakery products other than bread). Grown mainly in the Pacific Northwest; to a lesser extent in California, Michigan, Wisconsin and New York. Includes both winter and spring varieties. High yields. Relatively low protein. An important export wheat, particularly to the Far East. Subclasses include Hard White, Soft White, Western White and White Club.

SOFT RED WINTER: Grown in the eastern third of the United States. High yielding. Relatively low protein. Provides flour for cakes, pastries, quick breads, crackers and snack foods. No subclasses.



HARD RED SPRING: Another important bread wheat. Excellent protein content and milling and baking characteristics. Spring seeded. Grown in north central United States: North Dakota, South Dakota, Minnesota and Montana. Subclasses include Dark Northern Spring, Northern Spring and Red Spring.

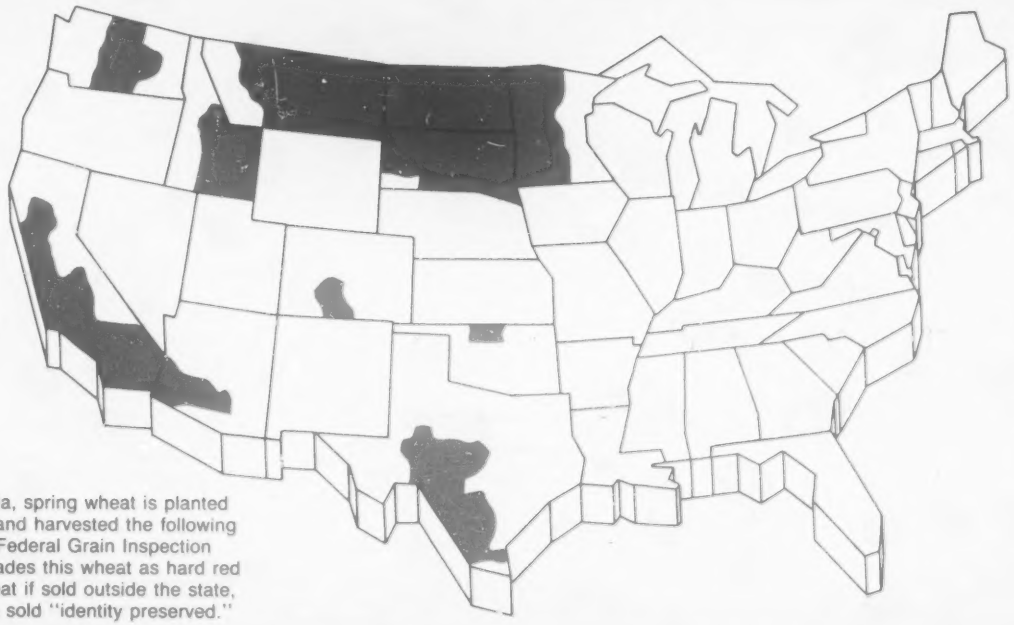
DURUM: The hardest of all U.S. wheat. Provides semolina for spaghetti, macaroni and other pasta products. Grown in the same northern area as Hard Red Spring, mainly in North Dakota. Subclasses are Hard Amber Durum, Amber Durum and Durum.

Other classes:

UNCLASSED WHEAT: Any variety of wheat which is not classifiable under other criteria provided in the wheat standards. There are no subclasses in this class. This class includes: 1) Red Durum wheat; 2) any wheat which is other than red or white in color.

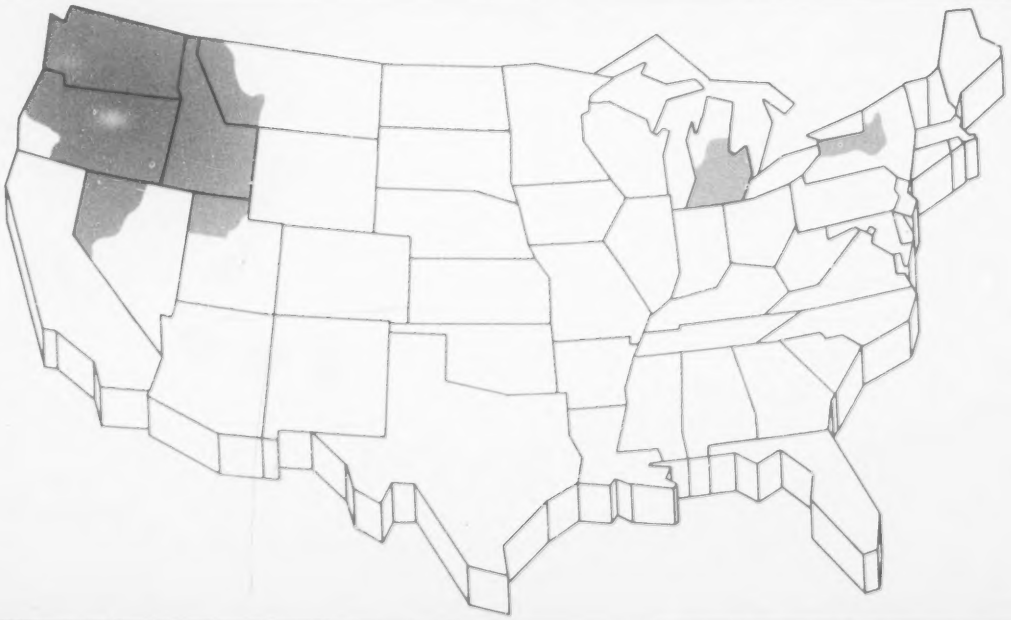
MIXED WHEAT: Any mixture of wheat consisting of less than 90 percent of one class and more than 10 percent of one other class, or a combination of classes which meets the definition of wheat.

U.S. WHEAT GROWING REGIONS
Hard Red Spring



In California, spring wheat is planted in the fall and harvested the following year. The Federal Grain Inspection Service grades this wheat as hard red spring wheat if sold outside the state, unless it is sold "identity preserved."

U.S. WHEAT GROWING REGIONS
White Wheat



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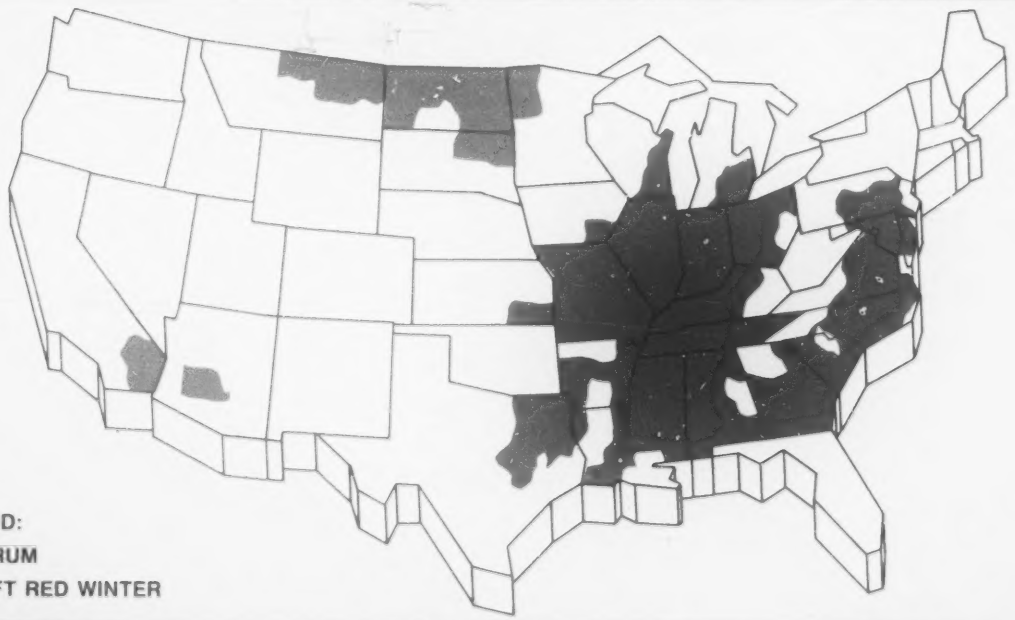
U.S. WHEAT GROWING REGIONS
Hard Red Winter

U.S. WHEAT GROWING REGIONS
Durum and Soft Red Winter



GRADES AND GRADE REQUIREMENTS FOR ALL CLASSES OF WHEAT
(EXCEPT MIXED)

	Minimum limits of—		Maximum limits of—						
	Test Weight per bushel							Wheat of other classes[4]	
	Hard Red Spring wheat or White Club wheat	All other classes and subclasses	Heat damaged kernels	Damaged kernels (total)[2]	Foreign material	Shrunken and broken kernels	Defects (total)[3]	Contrasting classes	Wheat of other classes[5]
	(pounds)[1]	(pounds)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
U.S. No. 1	58.0	60.0	0.2	2.0	0.5	3.0	3.0	1.0	3.0
U.S. No. 2	57.0	58.0	0.2	4.0	1.0	5.0	5.0	2.0	5.0
U.S. No. 3	55.0	56.0	0.5	7.0	2.0	8.0	8.0	3.0	10.0
U.S. No. 4	53.0	54.0	1.0	10.0	3.0	12.0	12.0	10.0	10.0
U.S. No. 5	50.0	51.0	3.0	15.0	5.0	20.0	20.0	10.0	10.0

U.S. Sample Grade . . . U.S. Sample Grade is wheat that:
(a) does not meet the requirements for the grades U.S. No. 1, 2, 3, 4, or 5; or
(b) contains 32 or more insect-damaged kernels per 100 grams of wheat; or
(c) contains 8 or more stones, 2 or more pieces of glass, 3 or more crotalaria seeds *(Crotalaria spp.)*, 2 or more castor beans *(Ricinus communis)*, 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), or 2 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1,000 grams of wheat; or
(d) has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or
(e) is heating or otherwise of distinctly low quality.

[1]These requirements also apply when Hard Red Spring wheat or White Club wheat predominate in a sample of Mixed wheat.
[2]Includes heat-damaged kernels.
[3]Defects (total) include damaged kernels (total), foreign material, and shrunken and broken kernels. The sum of these three factors may not exceed the limit for defects.
[4]Unclassed wheat of any grade may contain not more than 10 percent of wheat of other classes.
[5]Includes contrasting classes.

1987 U.S. WHEAT EXPORTS BY GRADE AND CLASS
(million bushels)

GRADE	HARD RED WINTER	SOFT RED WINTER	WHITE	HARD RED SPRING	DURUM	MIXED	TOTAL
No. 1	11.9	0.2	5.9	13.3	1.6	0.0	32.9
No. 2	554.2	139.8	177.6	164.9	21.9	2.5	1,060.0
No. 3	0.0	0.0	0.0	1.3	45.9	0.0	47.2
No. 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No. 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sample	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	566.1	140.0	183.5	179.5	69.4	2.5	1,141.0

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WHEAT PRODUCTION IN NAWG STATES, 1986–1988

State	Area Harvested (1,000 acres)			Yield (bushels per acre)			Production (1,000 bushels)		
	1986	1987	1988[1]	1986	1987	1988[1]	1986	1987	1988[1]
Arizona	96	89	85	90.5	89.9	96.4	8,688	8,005	8,200
Arkansas	780	840	1,050	41.0	41.0	51.0	31,980	34,440	53,550
California	675	537	499	76.3	77.5	84.4	51,525	41,610	42,125
Colorado	2,955	2,555	2,401	32.6	38.1	34.8	96,430	97,380	83,470
Idaho	1,310	1,140	1,170	62.4	75.0	66.1	81,750	85,500	77,280
Kansas	10,200	9,900	9,400	33.0	37.0	34.0	336,600	366,300	319,600
Minnesota	2,814	2,519	2,085	36.8	40.7	21.9	103,666	102,588	45,785
Montana	4,760	4,690	3,830	29.1	32.2	15.8	138,520	151,220	60,430
Nebraska	2,000	1,950	2,000	38.0	44.0	39.0	76,000	85,800	78,000
New Mexico	460	340	320	22.0	32.0	25.0	10,120	10,880	8,000
North Carolina	460	440	480	31.0	41.0	47.0	14,260	18,040	22,560
North Dakota	9,380	9,135	7,240	30.9	29.5	16.7	289,820	269,120	120,580
Oklahoma	5,200	4,800	4,800	29.0	27.0	36.0	150,800	129,600	172,800
Oregon	1,025	810	755	57.0	65.3	68.7	58,405	52,920	51,900
South Dakota	3,640	3,528	2,718	28.3	30.3	15.0	108,660	106,704	40,684
Texas	4,800	3,600	3,100	25.0	28.0	28.0	120,000	100,800	86,800
Washington	2,410	2,015	2,060	48.5	56.7	61.3	116,850	114,285	126,170
Wyoming	277	288	244	30.5	30.6	25.7	8,445	8,820	6,268
Total	53,442	49,176	44,237	33.7	36.3	31.7	1,802,519	1,784,012	1,404,202

[1]Indicated as of August 1, 1988.

U.S. WHEAT: SUPPLY AND USE, 1971–1988

Crop Year	Planted Acres (1,000)	Harvested Acres (1,000)	Yield (bu/a)	Production	Supply[1]	Domestic Food	Feed, Seed, Other	Exports	Total Use	Ending Stocks	Free Stocks	CCC Inventory	Farmer-Owned Reserve
				MILLION BUSHELS									
1971	53,822	47,685	33.9	1,619	2,443	524	326	610	1,459	983	628	355	13[2]
1972	54,913	47,303	32.7	1,546	2,531	532	267	1,135	1,934	597	591	6	11[2]
1973	59,254	54,148	31.6	1,711	2,311	544	209	1,217	1,971	340	340	1	—
1974	71,044	65,368	27.3	1,782	2,125	545	127	1,018	1,690	435	435	—	—
1975	74,900	69,499	30.6	2,127	2,564	589	137	1,173	1,898	666	666	—	—
1976	80,395	70,927	30.3	2,149	2,817	588	166	950	1,704	1,113	1,113	—	—
1977	75,410	66,686	30.7	2,046	3,161	587	273	1,124	1,983	1,178	788	48	342
1978	65,989	56,495	31.4	1,776	2,955	592	245	1,194	2,031	924	481	50	393
1979	71,424	62,454	34.2	2,134	3,060	596	187	1,375	2,158	902	454	188	260
1980	80,788	71,125	33.5	2,381	3,285	611	172	1,514	2,297	989	429	200	360
1981	88,251	80,642	34.5	2,785	3,777	602	245	1,771	2,618	1,159	407	190	562
1982	86,232	77,937	35.5	2,765	3,932	616	292	1,509	2,417	1,515	262	192	1,061
1983	76,419	61,390	39.4	2,420	3,939	643	469	1,429	2,540	1,399	600	188	611
1984	79,213	66,928	38.8	2,595	4,003	651	503	1,424	2,578	1,425	393	378	654
1985	75,575	64,734	37.5	2,425	3,866	683	363	915	1,961	1,905	870	602	433
1986	72,068	60,723	34.4	2,092	4,018	724	470	1,004	2,198	1,821	528	830	463
1987[3]	65,804	55,930	37.6	2,105	3,942	719	365	1,592	2,676	1,226	516	283	467
1988[4]	65,917	52,941	34.4	1,821	3,102	735	370	1,400	2,505	597	97	200	300

[1]Includes beginning stocks, production and imports.
[2]The farmer-owned reserve program began in 1977. Prior to that, the reseal program was in effect.
[3]Preliminary.
[4]Projected.

U.S. WHEAT BY CLASSES: SUPPLY AND DISAPPEARANCE 1987/88–1988/89
(million bushels)

Year beginning June 1	Hard Winter	Hard Spring	Soft Red	White	Durum	Total
1987/88 Beginning stocks	973	490	77	185	95	1,821
Production	1,019	431	348	216	93	2,105
Supply, total[1]	1,991	927	425	404	195	3,942
Domestic use	507	278	190	59	50	1,084
Exports	905	255	160	210	62	1,592
Use, total	1,412	533	350	269	112	2,676
Ending stocks, total	579	394	75	135	83	1,266
1988/89 Beginning stocks	579	394	75	135	83	1,266
Production	894	188	462	222	55	1,821
Supply, total[1]	1,473	589	537	360	143	3,102
Domestic use	523	186	258	82	56	1,105
Exports	685	235	250	190	40	1,400
Use, total	1,208	421	508	272	96	2,505
Ending stocks, total	265	168	29	88	47	597

[1]Includes imports.

PRICES RECEIVED BY FARMERS, ALL WHEAT NAWG STATES, 1985–88
(dollars per bushel)

	Marketing Year			1988					
STATE	1985	1986	1987	Jan.	Feb.	March	April	May	June
Arizona	3.52	3.38	3.02	3.85	4.04	n/a	n/a	3.60	4.28
Arkansas	3.04	2.49	2.45	2.79	n/a	2.62	n/a	2.49	3.35
California	3.43	2.92	2.82	3.15	2.93	3.43	n/a	3.40	3.71
Colorado	2.77	2.26	2.50	2.61	2.70	2.65	2.64	2.76	3.09
Idaho	3.18	2.39	2.57	2.74	2.86	2.70	2.87	2.98	3.17
Kansas	2.86	2.25	2.45	2.63	2.82	2.77	2.66	2.78	3.26
Minnesota	3.00	2.43	2.55	2.64	2.74	2.68	2.59	2.90	3.17
Montana	3.47	2.52	2.67	2.78	2.81	2.85	2.87	2.95	3.29
Nebraska	2.79	2.23	2.35	2.57	2.50	2.55	2.60	2.59	3.22
New Mexico	2.90	2.25	2.25	n/a	n/a	n/a	n/a	n/a	n/a
North Carolina	2.90	2.50	2.55	n/a	n/a	n/a	n/a	n/a	n/a
North Dakota	3.26	2.54	2.71	2.85	2.92	2.76	2.95	3.10	3.85
Oklahoma	2.91	2.28	2.45	2.77	2.85	2.73	2.71	2.83	3.34
Oregon	3.38	2.59	2.75	2.89	2.90	2.84	3.06	3.11	3.62
South Dakota	3.25	2.42	2.53	2.68	2.74	2.54	2.77	2.93	3.26
Texas	2.97	2.32	2.35	2.53	2.73	2.62	2.78	3.06	3.35
Washington	3.41	2.51	2.70	2.93	2.91	2.88	2.93	3.12	3.53
Wyoming	3.02	2.22	2.45	n/a	n/a	n/a	n/a	n/a	n/a

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ALL WHEAT: MONTHLY AVERAGE PRICES RECEIVED BY FARMERS 1979–1988

(dollars per bushel)

Crop Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Average Wt'd.	Average Simple
1979	3.72	3.89	3.74	3.87	3.98	3.94	3.81	3.74	3.78	3.64	3.58	3.69	3.78	3.78
1980	3.69	3.81	3.94	3.99	4.19	4.32	4.22	4.21	4.17	4.09	4.07	3.95	3.91	4.06
1981	3.70	3.62	3.62	3.65	3.77	3.85	3.80	3.78	3.70	3.67	3.68	3.64	3.65	3.71
1982	3.39	3.26	3.34	3.38	3.43	3.48	3.51	3.57	3.57	3.66	3.75	3.75	3.55	3.51
1983	3.50	3.34	3.61	3.65	3.61	3.54	3.48	3.50	3.40	3.49	3.63	3.66	3.54	3.53
1984	3.45	3.29	3.42	3.43	3.43	3.46	3.38	3.38	3.38	3.38	3.43	3.28	3.38	3.39
1985	3.09	2.93	2.89	3.00	3.09	3.23	3.25	3.19	3.15	3.28	3.36	3.02	3.16	3.12
1986	2.48	2.25	2.26	2.28	2.30	2.43	2.49	2.53	2.58	2.58	2.62	2.66	2.42	2.46
1987	2.45	2.31	2.31	2.54	2.62	2.69	2.70	2.75	2.79	2.74	2.79	2.99	2.57	2.64
1988	3.36	3.46[1]												

[1]Preliminary

WHEAT PROGRAM SUMMARY 1981–1989

Crop Year	Support/ Target Price ($/bushel)	Loan Rate ($/bushel)	Average Price to Farmers ($/bushel)	Number of Farms Participating	National Acreage Allotment/ Base (million a.)	Acreage Diversion Set Aside on Farms Participating (million a.)	Payments Diversion &SG&H[1] (million $)
1981	3.81	3.20/3.50	3.69	782,608	84.50[2]	none	none
1982	4.05	3.55/4.00	3.45	222,912	90.68[2]	5.80	none
1983	4.30	3.65	3.51	498,013	90.19	30.02	308.9
1984	4.38	3.30	3.39	317,565	93.96	18.45	506.1
1985	4.38	3.30	3.08	472,886	94.04	18.82	652.7
1986	4.38	2.40	2.42	456,725	91.60	21.01	215.0
1987	4.38	2.28	2.57	554,543	87.55	23.83	-
1988	4.23	2.21	-	551,262	85.27	22.81	-
1989	4.10	2.06	-	-	-	-	-

[1]Special Grazing and Hay program.
[2]National program acreage.

THE KERNEL OF WHEAT...

The wheat kernel, sometimes called the wheat berry, is the seed from which the wheat plant grows. Each tiny seed contains three distinct parts that are separated during the milling process to produce flour. The kernel of wheat is a storehouse of nutrients essential to the human diet.

Endosperm

...about 83 percent of the kernel weight. It is the source of white flour. The endosperm contains the greatest share of the protein in the whole kernel, carbohydrates, iron as well as many B-complex vitamins, such as riboflavin, niacin, and thiamine.

Bran

...about 14½ percent of the kernel weight. Bran is included in whole wheat flour and is also available separately. Of the nutrients in whole wheat, the bran contains a small amount of protein, larger quantities of the B-complex vitamins listed above, trace minerals, and indigestible cellulose material also called dietary flour.

NUTRIENT COMPARISION OF SELECTED WHEAT FOODS
*100 Grams Edible Portion

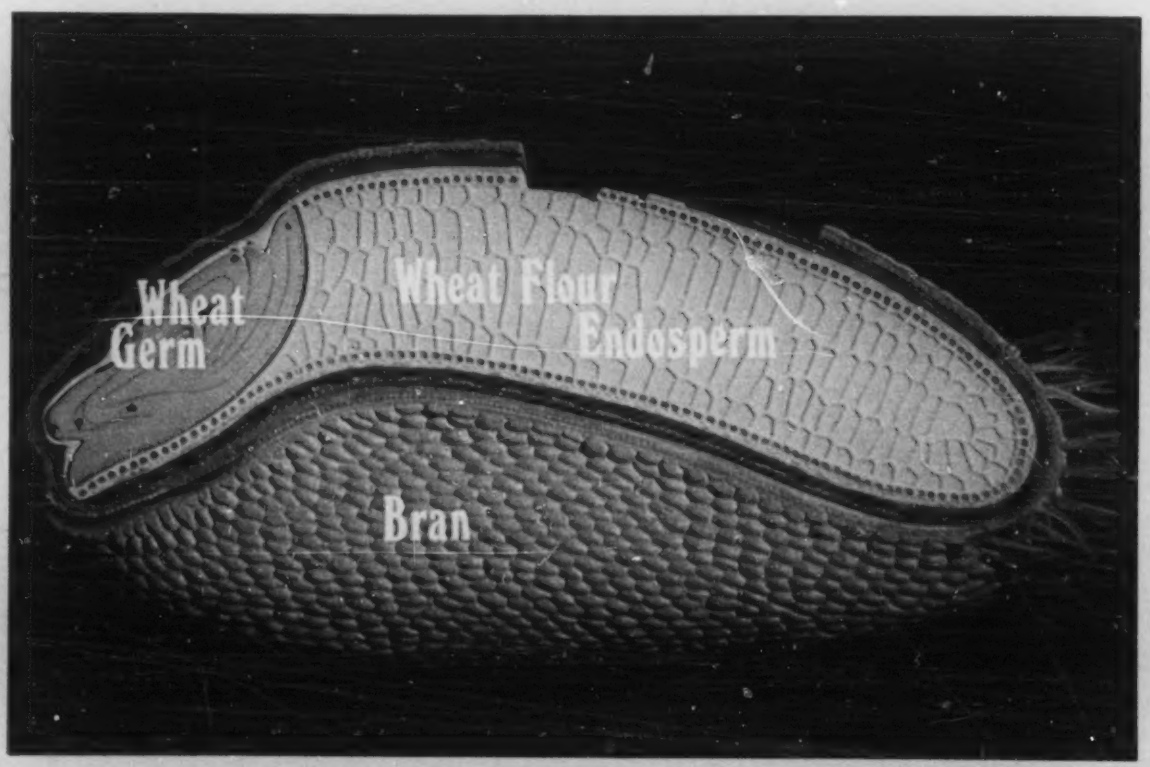
Product	Calories	Protein grams	Fat grams	Carbohydrate grams
White Bread	267	8.28	3.92	48.82
Whole Wheat Bread	245	9.62	4.36	45.41
Cookie, Chocolate Chip	463	5.00	26.81	64.08
Doughnut	419	5.10	23.07	48.97
English Muffin	237	7.91	1.94	45.94
Crackers, Cheese	538	9.13	32.68	51.95
Pasta, dry	(368)	12.80	1.60	75.10

*100 grams equal 3.5 ounces
Parentheses ( ) denote calculated values U.S.D.A. Human Nutrition Services

Germ

...about 2½ percent of the kernel weight. The germ is the embryo or sprouting section of the seed, usually separated because of the fat that limits the keeping quality of flour. Of the nutrients in whole wheat, the germ contains minimal quantities of protein, but a greater share of B-complex vitamins and trace minerals. Wheat germ can be purchased separately and is included in whole wheat flour.

Courtesy Wheat Foods Council.



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WHEAT NUTRIENTS

Wheat foods are an essential part of a balanced diet because they provide good nutritional value for their caloric cost. Following are the basic nutritional components of wheat foods:

CARBOHYDRATE

Complex Carbohydrate—Wheat flour is a good source of complex carbohydrate, the most efficient source of energy available to the human body. Unlike simple carbohydrates, such as sugars, which are quickly absorbed into the blood stream, complex carbohydrate provides a steady source of fuel because it is released slowly.

Fiber—Fiber is the undigestible carbohydrate in food which acts like a broom to sweep out the digestive tract. Adequate fiber intake has been related to a lower incidence of cancer of the colon and some types of heart disease and to better control diabetes. One slice of whole wheat bread contains 1.5 grams of dietary fiber; one slice of white bread contains 0.5 grams.

PROTEIN

Wheat foods are moderate sources of incomplete protein. This means that while wheat and other cereal grains may contain all eight of the amino acids necessary for good health, not all eight are found at adequate levels. However, combining wheat or other cereal grains with animal proteins or legumes makes the grain protein complete. Within the cereal group, wheat contains more protein than rice or corn.

FAT

Fats account for 2 to 23 percent of wheat foods, although wheat alone contains very little fat. Most often, the fat content in wheat foods results from fat added in production, such as the oil or shortening found in many baked or fried wheat foods. Bread and pasta products are low-fat foods because the major ingredient, by weight, is wheat flour.

OTHER VITAMINS AND MINERALS

Thiamine—One of the essential B-vitamins needed daily for good appetite, digestion and healthy nerves. Thiamine helps the body make better use of fat and carbohydrate. Wheat foods are a good source of thiamine.

Niacin—A B-vitamin essential for the efficient use of protein by the body. Wheat foods are a good source of niacin.

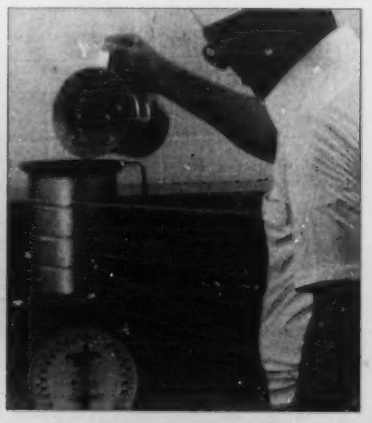
Iron—Vital to nutrition. Combines with protein to form hemoglobin, a compound in red blood cells that carries oxygen from the lungs to each cell in the body while it carries away carbon dioxide. Wheat foods are a reliable source of iron for normal dietary needs.

Zinc—Important for skin healing and growth properties. Wheat foods are a good source of zinc.

Riboflavin—Essential for growth and good vision. Helps the body make use of carbohydrate, fat and protein. Wheat foods are a fair source of riboflavin.

Trace Minerals—Wheat foods are a good source of selenium and magnesium, nutrients essential to good health.

Courtesy Wheat Foods Council



WHEAT FLOURS

ALL-PURPOSE FLOUR

All-purpose flour is the finely ground endosperm of the wheat kernel separated from the bran and germ during the milling process. All-purpose flour is made from hard wheats or a combination of soft and hard wheat from which the home baker can make a complete range of satisfactory baked products such as yeast breads, cakes, cookies, pastries and noodles.

Enriched All-Purpose Flour has iron and B-vitamins added in amounts equal to or exceeding that of whole wheat flour.

Bleached Enriched All-Purpose Flour is treated with chlorine to mature the flour, condition the gluten and improve the baking quality. The chlorine evaporates and does not destroy the nutrients but does reduce the risk of spoilage or contamination.

Unbleached Enriched All-Purpose Flour is bleached by oxygen in the air during an aging process and is off-white in color. Nutritionally, bleached and unbleached flour are the same.

BREAD FLOUR

Bread flour, from the endosperm of the wheat kernel, is milled primarily for commercial bakers but is also available at retail outlets. Although similar to all-purpose flour, it has a greater gluten strength and generally is used for yeast breads.

SELF-RISING FLOUR

Self-rising flour is an all-purpose flour with salt and leavening added. One cup of self-rising flour contains 1-1/2 teaspoons baking powder and 1/2 teaspoon salt. Self-rising flour can be substituted for all-purpose flour in a recipe by reducing salt and baking powder according to those proportions.

WHOLE WHEAT FLOUR

Whole wheat flour is a coarse-textured flour ground from the entire wheat kernel and thus contains the bran, germ and endosperm. The presence of bran reduces gluten development. Baked products made from whole wheat flour tend to be heavier and denser than those made from white flour.

OTHER FLOURS

Cake Flour—Milled from soft wheat. Especially suitable for cakes, cookies, crackers and pastries. Low in protein and gluten.

Pastry Flour—Milled from a soft, low gluten wheat. Comparable in protein but lower in starch than cake flour.

Gluten Flour—Used by bakers in combination with flours having a low protein content because it improves the baking quality and produces gluten bread of high protein content.

Semolina—Coarsely ground endosperm of durum wheat. High in protein. Used in high quality pasta products.

Durum Flour—By-product of semolina production. Used to make commercial U.S. noodles.

Farina—Coarsely ground endosperm of hard wheats. Prime ingredient in many U.S. breakfast cereals. Also used in the production of inexpensive pasta.

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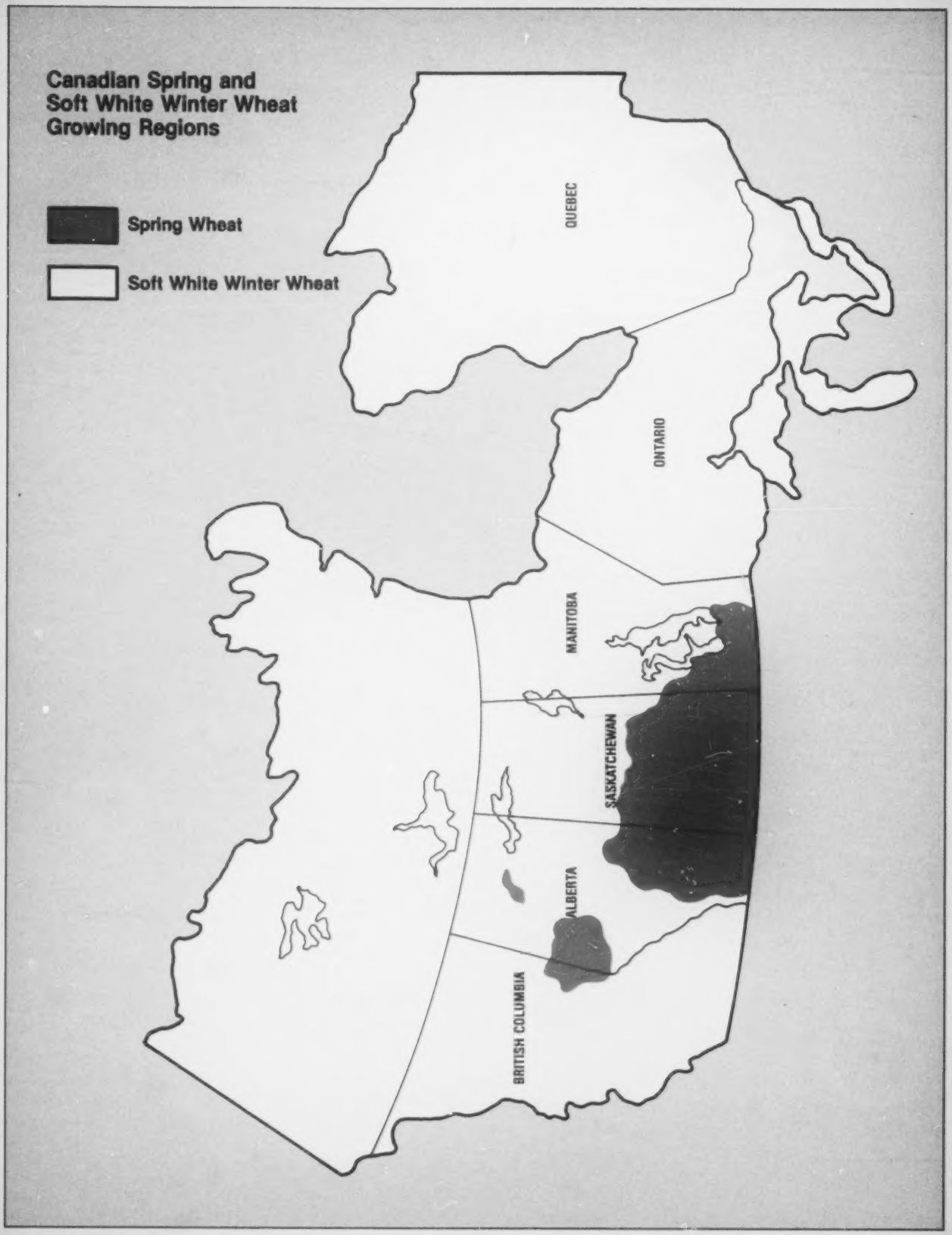
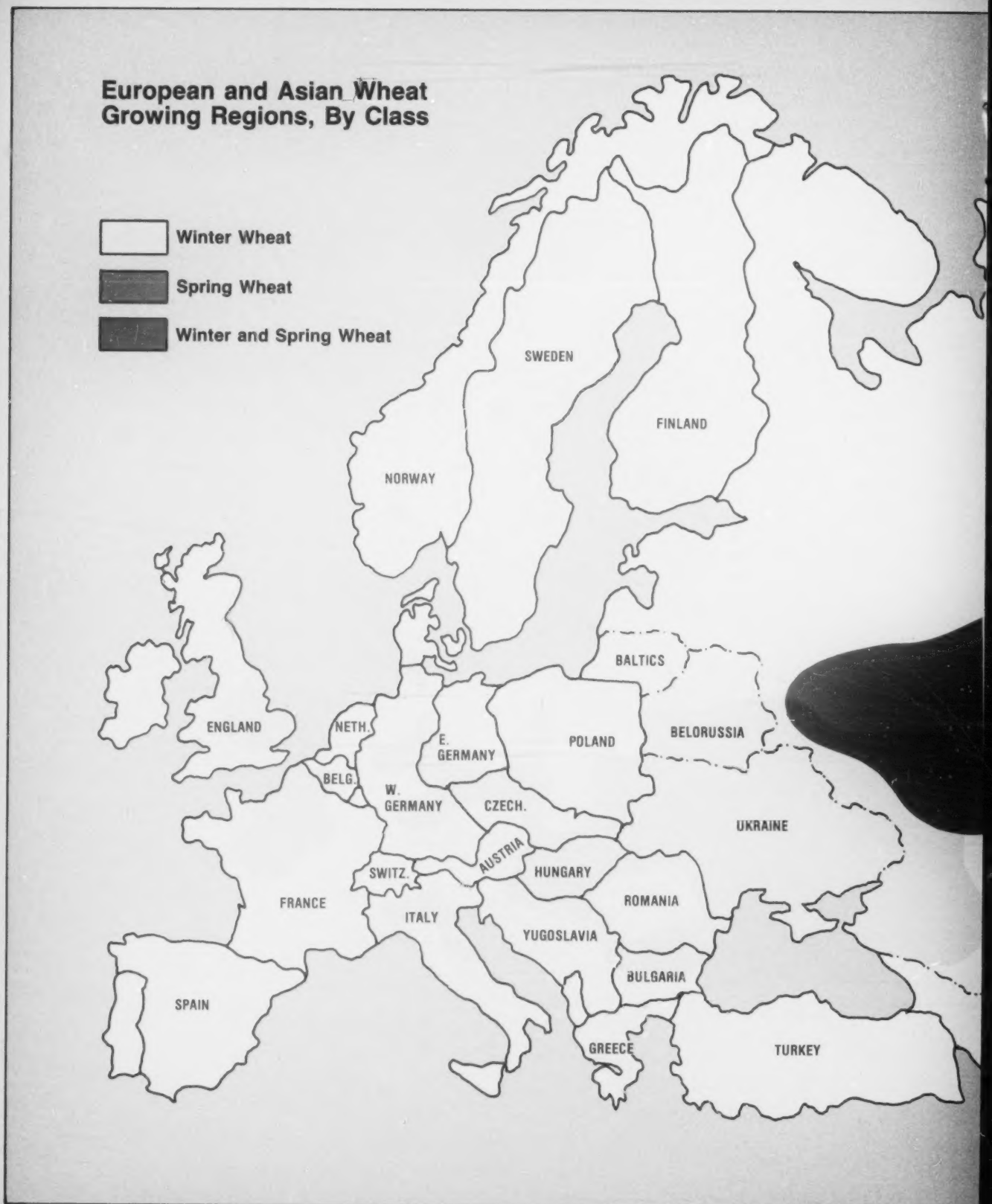

Canadian Spring and
Soft White Winter Wheat
Growing Regions
Spring Wheat
Soft White Winter Wheat
QUEBEC
ONTARIO
MANITOBA
SASKATCHEWAN
ALBERTA
BRITISH COLUMBIA



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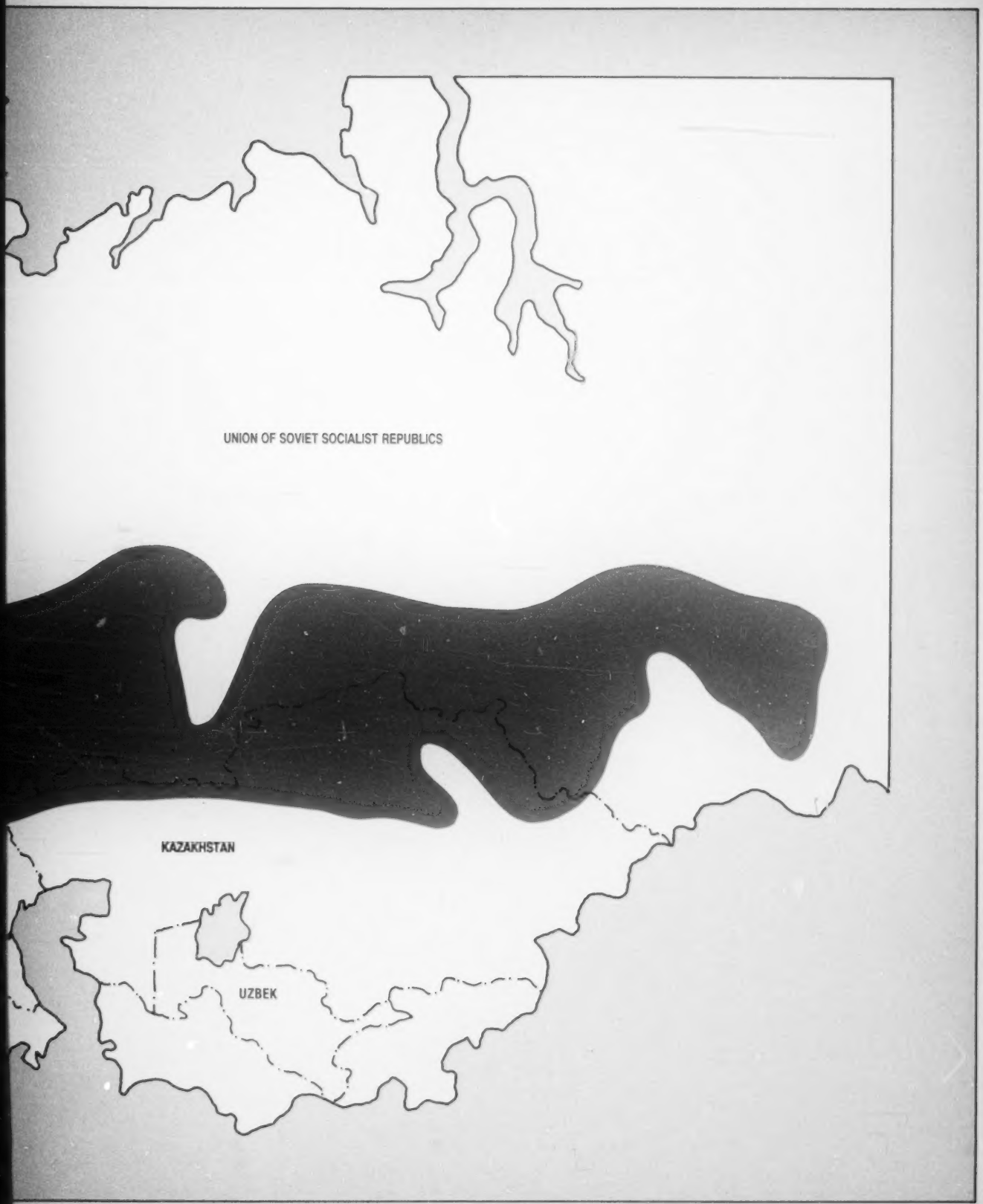

UNION OF SOVIET SOCIALIST REPUBLICS
KAZAKHSTAN
UZBEK

Australian Winter Wheat Growing Regions

Chinese Winter Wheat Growing Regions

1 SHANDON
2 HEBEI
3 SHANXI
4 HENAN
5 SHAANXI
6 HUBEI
7 ANHUI
8 JIANGSU
9 ZHEJIANG
10 SICHUAN
11 BEIJING
12 TIAJIN

Sponsored by CIBA-GEIGY

U.S. WHEAT EXPORTS BY DESTINATION, 1984/85–1987/88

Ranked in Descending Order for Marketing Year 1987/88 Compared with the Four Previous Marketing Years (1,000 metric tons)

Country	1987/88 Quantity	Rank	1986/87 Quantity	Rank	1985/86 Quantity	Rank	1984/85 Quantity	Rank
USSR	12,375	1	–	–	153	29	6,339	1
China	3,856	2	61	50	581	13	2,735	4
Japan	3,236	3	3,317	1	3,236	1	3,306	2
Egypt	2,514	4	2,556	2	1,491	3	1,634	7
Korea	2,095	5	1,777	3	1,955	2	1,976	5
Algeria	1,991	6	1,729	4	1,247	4	468	22
Morocco	1,874	7	1,428	5	1,099	5	1,684	6
Poland	1,489	8	543	14	81	41	65	45
Iraq	1,068	9	727	9	662	10	798	10
Taiwan	872	10	816	7	657	11	655	14
Bangladesh	780	11	438	18	228	25	851	9
Tunisia	593	12	620	12	62	46	631	16
Philippines	567	13	713	10	685	9	727	12
Israel	494	14	538	15	470	16	575	19
Sudan	437	15	263	22	341	22	255	26
Venezuela	419	16	891	6	612	12	783	11
Sri Lanka	367	17	397	19	190	26	230	27
Italy	357	18	521	16	365	21	311	25
Ecuador	340	19	332	20	392	19	339	24
Colombia	315	20	276	21	498	15	633	15
Yugoslavia	256	21	576	13	–	–	–	–
Jordan	233	22	151	33	184	27	203	28
Indonesia	231	23	441	17	259	23	593	17
Yemen (Sana)	230	24	180	26	30	52	105	37
Mexico	228	25	87	44	–	–	21	59
Pakistan	198	26	74	48	851	7	44	49
Peru	190	27	222	24	153	28	483	21
Bolivia	181	28	172	27	114	35	34	54
El Salvador	154	29	141	34	126	33	140	30
Bulgaria	154	30	–	–	–	–	–	–
Zaire	149	31	154	31	110	37	106	36
Guatemala	139	32	107	38	151	30	114	32
Jamaica	138	33	152	32	146	31	92	40
Belgium	134	34	113	37	69	45	54	46
Thailand	119	35	84	45	77	43	99	39
Hong Kong	115	36	107	40	106	38	110	34
Haiti	114	37	97	42	119	34	107	35
Kenya	112	38	69	49	82	40	30	58
Portugal	111	39	128	35	505	14	563	20
Costa Rica	109	40	105	41	136	32	121	31
Finland	95	41	23	61	56	47	50	48
Honduras	88	42	107	39	78	42	86	42
Senegal	87	43	11	73	–	–	–	–
Trinidad	80	44	116	36	110	36	111	33
Panama	78	45	93	43	84	39	65	44

WHEAT INSPECTED FOR EXPORT BY CLASS, REGION AND PORT AREA

June 1987–May 1988 (1,000 bushels)

Port Area	Hard Red Spring	Hard Red Winter	Soft Red Winter	White	Durum	Mixed	Total
St. Lawrence Seaway	5,657	0	342	25	3,579	0	9,603
Lakes (Overseas)							
Duluth-Superior Area	29,093	256	0	76	36,558	0	65,983
Toledo Area	0	0	636	0	0	0	636
Subtotal	29,093	256	636	76	36,558	0	66,619
Atlantic							
North	0	0	0	637	0	0	637
South	0	0	26,373	0	0	0	26,373
Subtotal	0	0	26,373	637	0	0	27,010
Gulf							
Mississippi River	91,413	22,733	117,499	0	3,817	274	235,736
East Gulf	395	1,519	6,814	0	540	0	9,268
N. Texas Gulf	19,727	687,698	1,709	0	9,991	3,185	722,310
S. Texas Gulf	0	36,965	0	0	0	0	36,965
Subtotal	111,535	748,915	126,022	0	14,348	3,459	1,004,279
Pacific							
Columbia River	105,554	112,244	0	207,790	1,582	0	427,170
Puget Sound	4,309	2,088	0	5,144	0	0	11,541
California	0	13,413	0	0	2,168	0	15,581
Subtotal	109,863	127,745	0	212,934	3,750	0	454,292
Interior	0	2,088	0	0	10	0	2,098
Totals							
June 87–May 88	256,148	879,004	153,373	213,672	58,245	5,459	1,563,901
June 86–May 87	187,702	383,365	105,578	173,411	79,035	4,103	933,394

Wheat shipped for storage in Canada is reported at the time of shipment from St. Lawrence Seaway ports.

WORLD WHEAT PRODUCTION, CONSUMPTION, MAJOR IMPORTERS[1]

1986/87–1988/89 (million metric tons)

Country	1986/87 Prod.	1986/87 Cons.	1986/87 Imports	1987/88[2] Prod.	1987/88[2] Cons.	1987/88[2] Imports	1988/89[3] Prod.	1988/89[3] Cons.	1988/89[3] Imports
USSR	92.31	102.81	16.00	83.31	100.50	21.50	93.00	102.00	14.00
China	90.00	101.50	8.50	87.70	105.20	14.50	89.00	104.50	12.50
Egypt	1.93	8.31	6.50	2.44	8.81	6.70	2.52	9.12	6.70
Japan	.88	6.10	5.78	.86	6.10	5.40	1.00	6.03	5.40
South Korea	.01	3.90	3.90	.08	3.96	3.90	0	3.85	3.90
Algeria	1.23	4.74	3.41	1.02	4.82	3.80	.90	4.70	3.80
Iran	7.10	8.90	2.50	6.00	9.60	3.60	6.80	9.80	3.00
India	47.01	45.57	0	45.58	51.09	.40	45.00	50.50	2.60
Iraq	1.04	3.70	2.80	.72	3.65	2.70	.72	3.55	2.60
Bangladesh	1.09	2.70	1.50	1.05	3.01	2.20	1.20	3.05	1.80
Indonesia	0	1.52	1.50	0	1.60	1.60	0	1.75	1.75
Pakistan	13.92	13.20	.37	12.02	13.73	.50	12.56	13.95	1.65
Poland	7.50	8.97	2.30	7.94	9.79	2.00	7.34	7.90	1.60
Morocco	3.32	4.58	1.50	2.43	4.78	2.30	3.25	4.73	1.50
Cuba	0	1.30	1.30	0	1.40	1.40	0	1.40	1.40
Brazil	5.60	8.00	2.80	6.15	7.10	1.90	5.70	7.00	1.30
Total World	529.70	521.71	99.03	504.48	532.09	112.36	514.18	533.89	103.07

[1]Trade on July–June years; production and consumption on local crop year. [2]Preliminary. [3]Forecast

Sponsored by CIBA-GEIGY

WHEAT SUPPLY AND DISAPPEARANCE: MAJOR EXPORTERS

1983/84–1988/89
(million metric tons/hectares)

	Area Harvested	Yield	Production	Domestic Use	Exports[1] July/June	Exports[1] Mkt. Year	Percentage of World Trade	Exports as Percentage of Production	Mkt. Year Ending Stocks[2]
ARGENTINA (Marketing Year December/November)									
1983/84	6.9	1.85	12.8	4.7	9.7	7.8	9.5	75.8	1.3
1984/85	6.0	2.22	13.2	4.6	8.0	9.4	7.5	60.6	0.5
1985/86	5.3	1.61	8.5	4.4	6.1	4.3	7.2	71.8	0.3
1986/87	5.1	1.75	8.9	4.4	4.3	4.4	4.7	48.3	0.3
1987/88[3]	4.9	2.04	10.0	4.5	4.0	5.6	3.9	40.0	0.2
1988/89[4]	5.3	1.89	10.0	4.5	6.0	5.5	6.2	60.0	0.2
AUSTRALIA (Marketing Year October/September)									
1983/84	12.9	1.70	22.0	3.4	10.6	13.3	10.4	48.2	7.5
1984/85	12.1	1.55	18.7	2.9	15.8	14.7	14.8	84.5	8.6
1985/86	11.7	1.38	16.2	2.7	16.0	16.0	18.9	98.8	6.0
1986/87	11.3	1.44	16.2	2.7	14.8	15.7	16.3	91.4	3.9
1987/88[3]	9.1	1.37	12.4	2.7	12.2	10.5	11.8	98.4	3.1
1988/89[4]	9.5	1.37	13.0	2.8	10.8	10.2	11.2	83.1	3.1
CANADA (Marketing Year August/July)									
1983/84	13.7	1.94	26.5	5.6	21.8	21.8	21.4	82.3	9.2
1984/85	13.2	1.61	21.2	5.2	19.4	17.6	18.1	91.5	7.6
1985/86	13.7	1.77	24.3	5.6	16.8	17.7	19.9	69.1	8.6
1986/87	14.2	2.20	31.4	6.2	20.8	20.8	22.9	66.2	13.0
1987/88[3]	13.5	1.95	26.3	7.6	22.5	22.5	21.8	85.6	9.2
1988/89[4]	13.0	1.62	21.0	5.1	18.0	18.0	18.6	85.7	7.1
EUROPEAN COMMUNITY (Marketing Year July/June)									
1983/84	16.1	3.97	63.8	56.0	15.5[5]	22.3	15.2	24.3	8.8
1984/85	16.2	5.13	82.9	59.9	18.5[5]	28.4	17.3	22.3	16.4
1985/86	15.3	4.69	71.6	59.3	15.6[5]	27.8	18.4	21.8	16.3
1986/87	15.7	4.58	71.9	57.6	16.4[5]	28.0	18.1	22.8	16.0
1987/88[3]	15.9	4.48	71.2	58.4	14.5	27.1	14.0	20.4	15.1
1988/89[4]	15.6	4.87	75.8	59.3	17.0	28.2	17.5	22.4	15.8
UNITED STATES (Marketing Year July/June)									
1983/84	24.8	2.65	65.9	30.2	38.9	38.9	38.2	59.0	38.1
1984/85	27.1	2.61	70.6	31.4	38.1	38.8	35.6	54.0	38.8
1985/86	26.2	2.52	66.0	28.5	25.0	24.9	29.4	37.9	51.8
1986/87	24.6	2.32	56.8	32.5	28.4	27.3	31.3	50.0	49.6
1987/88[3]	22.6	2.53	57.3	29.3	43.5	43.5	42.1	75.9	34.5
1988/89[4]	21.4	2.13	49.6	30.1	38.1	36.7	38.2	76.8	16.3

[1]Includes the wheat equivalent of flour.
[2]Net change in farm stocks for Argentina and Australia are reflected in domestic disappearance.
[3]Preliminary.
[4]Projected.
[5]Excludes Intra-EC trade.

WHEAT: WEIGHTS, MEASURES AND CONVERSION FACTORS

Bushel Weights:

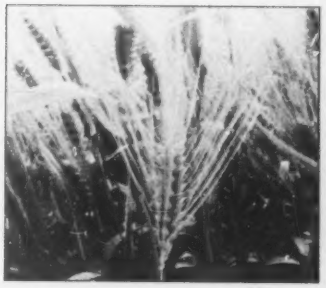
1 bu. wheat/soybeans	= 60 lbs.
1 bu. corn/sorghum	= 56 lbs.
1 bu. barley	= 48 lbs.
1 bu. oats	= 32 lbs.

1 Bushel of Wheat Equals:

0.030	short tons
0.0272155	metric tons
0.0267857	long tons
27.21555	kilograms

Bushels to Metric Tons:

Wheat/soybeans	=	bu.	×	0.027216
Corn/sorghum	=	bu.	×	0.025400
Barley	=	bu.	×	0.021772
Oats	=	bu.	×	0.014515



Wheat Flour Equivalents

1 metric ton wheat flour	= 1.38 metric ton wheat
100 pounds	= 2.3 bushels
43.5 pounds	= 1 bushel
1 barrel wheat flour	= 196 pounds
4.51 bushels	= 1 barrel of flour

1 Metric Ton Equals

2,204.622	pounds
1,000	kilograms
36.74371	bu. of wheat or soybeans
39.3679	bu. of corn or sorghum
45.9296	bu. of barley
68.8944	bu. of oats
22.046	hundredweight
10	quintals

Acreage Equivalents

1 hectare	= 2.4710 acres
1 sq. mile	= 640 acres (259 hectares)
1 acre	= 0.404694 hectares = 4,840 sq. yards = .9 football fields, excluding end zones.

Test Weight

pounds/bushel × 1.2872 = kilograms/hectalitre

Yield Equivalents

Wheat:	bu./acre x 0.6725	= metric tons/hectare
Corn:	bu./acre x .06277	= metric tons/hectare
Barley:	bu/acre x .05380	= metric tons/hectare
Oats:	bu./acre x .03587	= metric tons/hectare

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September–October 1989

DEPARTMENTS

2 **Presidential Perspectives**
Prescriptions For The Farm Bill

3 **Washington Update**

INTERVIEW

4 **Preparing For The Agriculture Of The 1990s**
New Under Secretary Faces Domestic, Foreign Challenges

If they remain on schedule, the Congress and administration plan to write a new farm bill by June 1990. They then will turn their attention to international trade talks, of which world agricultural trade is a major component.

Under Secretary of Agriculture Richard Crowder will be a key figure in both these important events. This month's interview looks at some of the issues that will be in the news in the next 18 months.

PAGE 4/Interview with Richard Crowder

WHEAT FACTS

This month's issue features our annual "Wheat Facts" section of background information and statistics on virtually every aspect of the U.S. and world wheat industries.

FEATURE STORY

8 **LISA Emerges As Complex Agricultural Issue**
Environmental Concerns Will Take Center Stage In The 1990s

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PRESIDENTIAL PERSPECTIVES

PRESCRIPTIONS FOR THE FARM BILL

The National Association of Wheat Growers has taken the position that while the 1985 farm bill was not perfect, we generally are satisfied with its results. We therefore believe that federal farm legislation in the 1990s should carry on the successes and progress of the current farm program, including an income safety net for farmers—in the form of loans and target prices—and a "fine-tuning" mechanism for the federal government to balance wheat supplies with anticipated damand—in the form of set-asides, acreage diversions and the amounts of wheat permitted to be entered into the farmer-owned grain reserve.

There are other areas that will need looking at as well if we don't want the U.S. agricultural economy to slip into stagnation. Foremost among these is a need to grant farmers increased freedom to plant more of their acreages as they see fit, without having to worry about losing possible future federal farm program benefits.

Consequently, we have asked the Congress to take a close look at reinstituting the normal crop acreage concept with the inclusion of summer fallow acreage. As many of you will remember, under an NCA, your farm base is the total of all acres planted to program crops rather than the crop-specific bases in the the current program.

What this will mean is that growers won't be locked into producing certain crops even if a surplus develops for that crop or if planting another crop could provide more income from the market.

The normal crop acreage concept, properly administered, could provide farmers with the flexibility they need to meet anticipated market demands. We have evaluated the so-called "triple base" plan—which also is aimed at providing planting flexibility—and have found it to be more budget driven than flexibility driven. The bottom line on triple base is that it is nothing more than a back door way of cutting target prices to farmers.

We also asked that the Congress continue the export enhancement program that has proven so vital to the current and future economic health of this nation's wheat farmers. This program also has the important side benefit of providing our negotiators with a strong bargaining tool during upcoming world trade talks under the General Agreement on Tariffs and Trade.

Lastly, we let the Congress know of our ongoing commitment to conservation and environmental protection programs, but urged lawmakers to think carefully before linking commodity programs to conservation programs. We would prefer an expanded commitment toward research and education to ensure that we can address concerns about chemical use and its effect upon groundwater, the environment and food safety.

The long process of writing this next farm bill will take us well into next year. The NAWG, its officers and staff will be working to represent your interests.

Stay tuned.

Reggie Wyckoff is president of the NAWG.

The Wheat Grower

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WHEAT FACTS

1989

This special supplement is compiled by *The Wheat Grower.*

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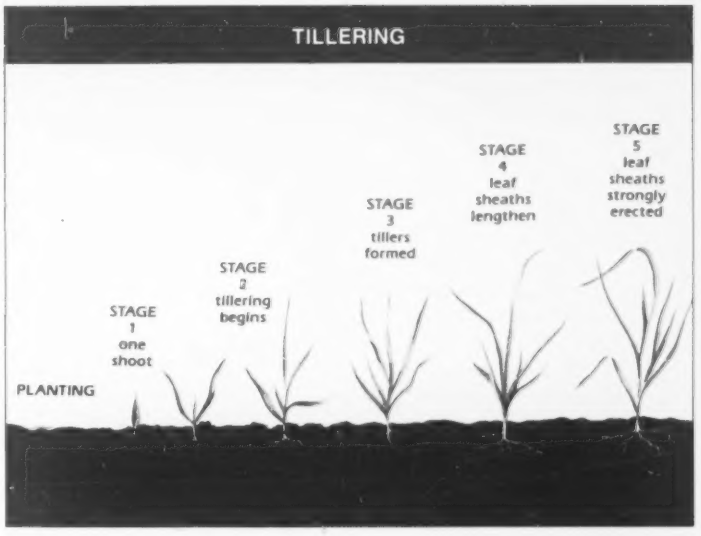
A

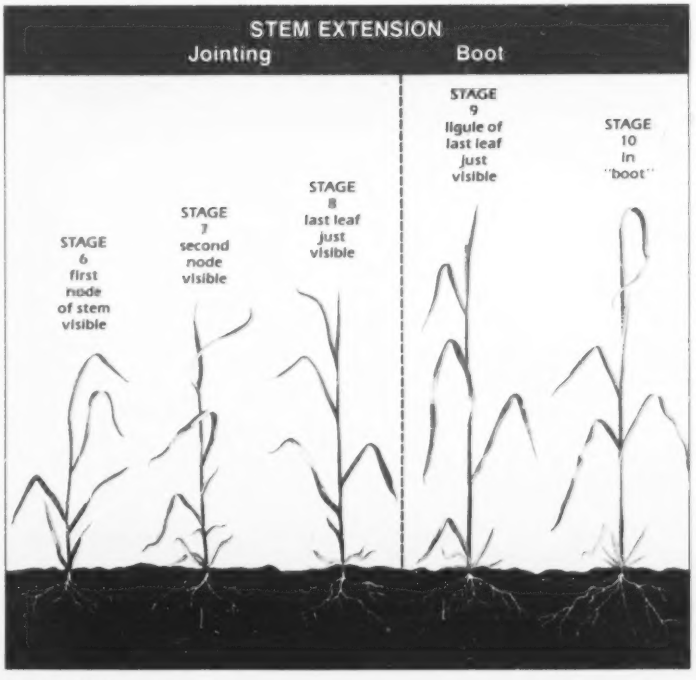
FEEKES' SCALE OF WHEAT DEVELOPMENT

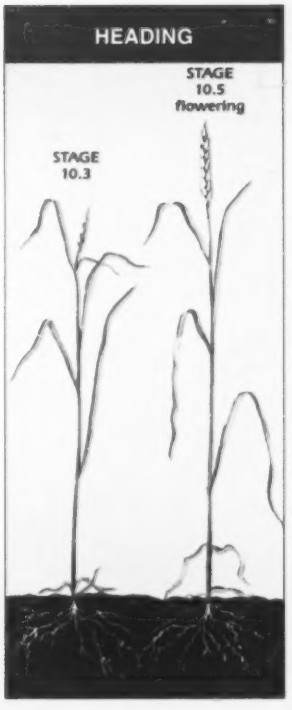
Knowing the various stages of growth and development of a wheat crop enables growers to exercise better management of inputs by allowing these inputs to be used at the proper growth stage and not according to a calendar date.

Agronomists have developed the "Feekes' Scale," an objective measure of the growth and development of wheat plants, to help growers identify the optimum time to apply inputs.

This measuring system ranges from 1.0 (to designate emergence of the first seedling leaf) to 11.4 (to designate mature plants with hard grain).




STEM EXTENSION
Jointing
Boot
STAGE 6 first node of stem visible
STAGE 7 second node visible
STAGE 8 last leaf just visible
STAGE 9 ligule of last leaf just visible
STAGE 10 in "boot"

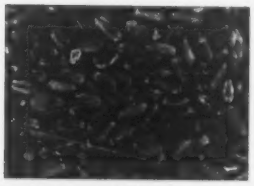


Courtesy Mobay

FIVE BASIC CLASSES OF WHEAT

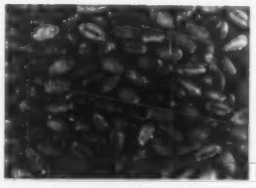
Wheat varieties grown in the United States are either "winter wheat" or "spring wheat," depending on the season each is planted. Winter wheat is sown in the fall and has some preliminary growth before cold weather arrives. The plants have a special gene that allows them to lie dormant through the winter. In the spring, they resume growth and grow rapidly until summertime harvest. Spring wheat, produced in northern states where winters are too severe for fall-sown wheat, is sown in the spring as soon as the ground is workable and grows continuously until harvest.

The many varieties of winter and spring wheat are grouped into five basic classes. The class each variety fits into is determined by the hardness, color and shape of its kernels, as well as by its planting time. Each class of wheat has its own similar family characteristics, especially as related to milling and to baking or other food use. The five basic classes are:



HARD RED WINTER: An important bread wheat. Accounts for a majority of the U.S. wheat crop. Produced in the Great Plains states, a large interior area extending from the Mississippi River west to the Rocky Mountains, and from the Dakotas and Montana down to Texas. Fall seeded. Wide range of protein content. Good milling and baking characteristics. No subclasses.

WHITE WHEAT: Used in the same ways as Soft Red Winter (for bakery products other than bread). Grown mainly in the Pacific Northwest; to a lesser extent in California, Michigan, Wisconsin and New York. Includes both winter and spring varieties. High yields. Relatively low protein. An important export wheat, particularly to the Far East. Subclasses include Hard White, Soft White, Western White and White Club.



SOFT RED WINTER: Grown in the eastern third of the United States. High yielding. Relatively low protein. Provides flour for cakes, pastries, quick breads, crackers and snack foods. No subclasses.

HARD RED SPRING: Another important bread wheat. Excellent protein content and milling and baking characteristics. Spring seeded. Grown in north central United States: North Dakota, South Dakota, Minnesota and Montana. Subclasses include Dark Northern Spring, Northern Spring and Red Spring.

DURUM: The hardest of all U.S. wheat. Provides semolina for spaghetti, macaroni and other pasta products. Grown in the same northern area as Hard Red Spring, mainly in North Dakota. Subclasses are Hard Amber Durum, Amber Durum and Durum.

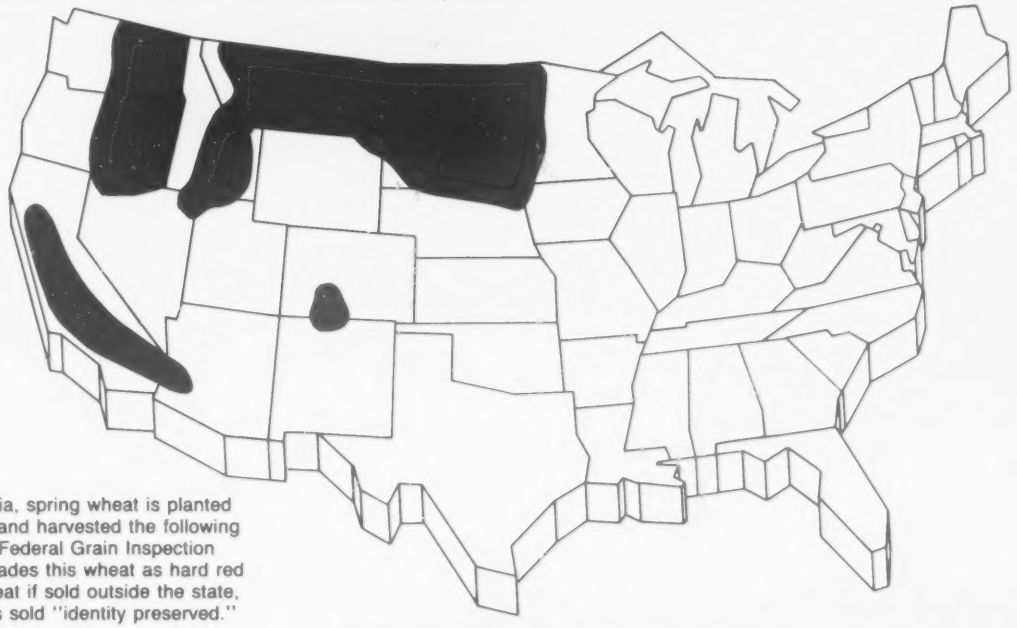
Other classes:

UNCLASSED WHEAT: Any variety of wheat which is not classifiable under other criteria provided in the wheat standards. There are no subclasses in this class. This class includes: 1) Red Durum wheat; 2) any wheat which is other than red or white in color.

MIXED WHEAT: Any mixture of wheat consisting of less than 90 percent of one class and more than 10 percent of one other class, or a combination of classes which meets the definition of wheat.

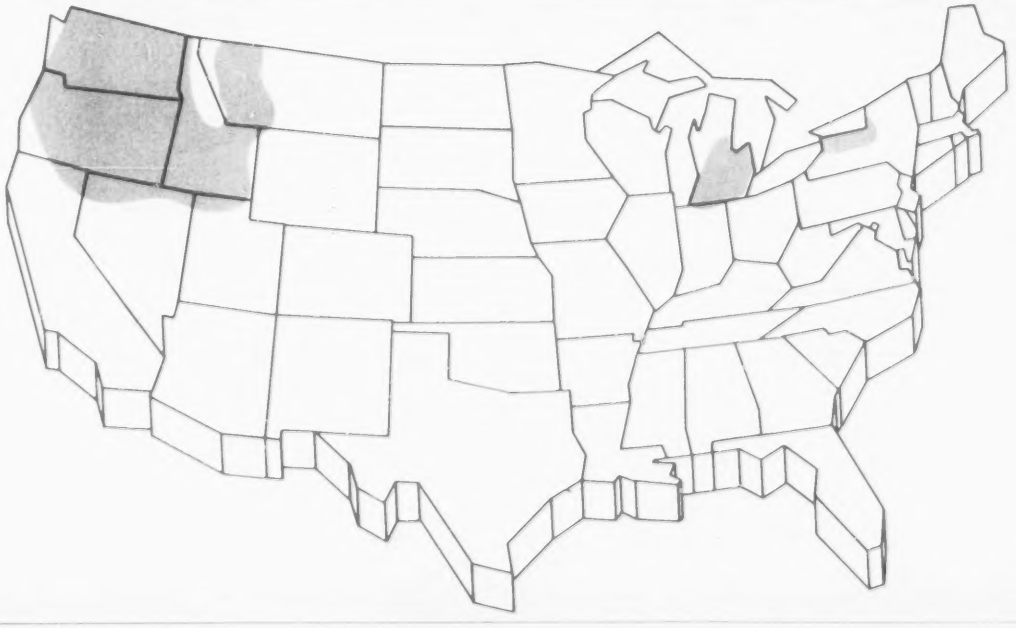
C

U.S. WHEAT GROWING REGIONS
Hard Red Spring

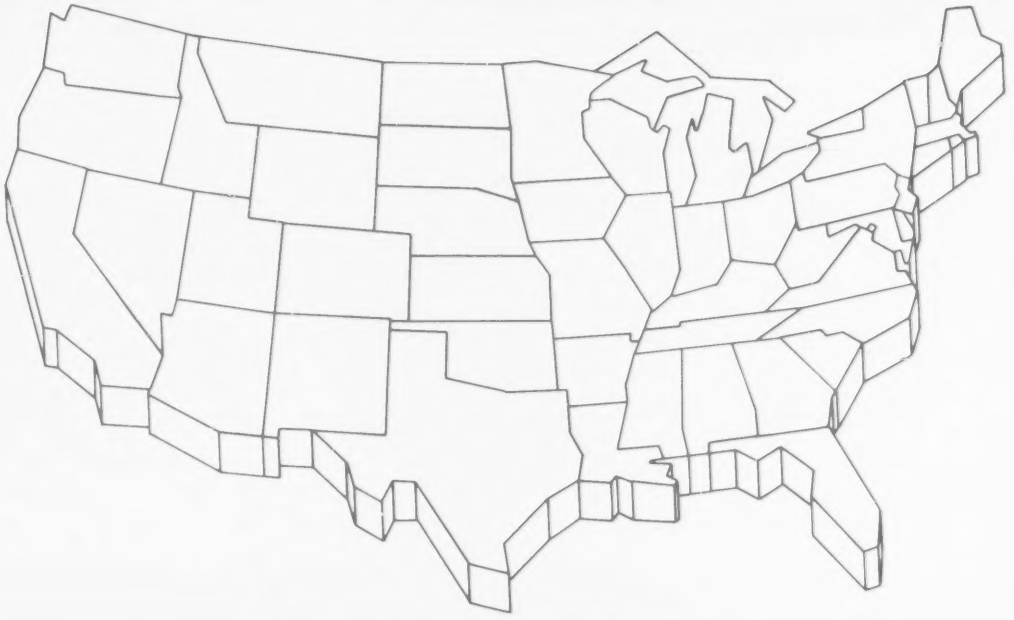


In California, spring wheat is planted in the fall and harvested the following year. The Federal Grain Inspection Service grades this wheat as hard red spring wheat if sold outside the state, unless it is sold "identity preserved."

U.S. WHEAT GROWING REGIONS
White Wheat

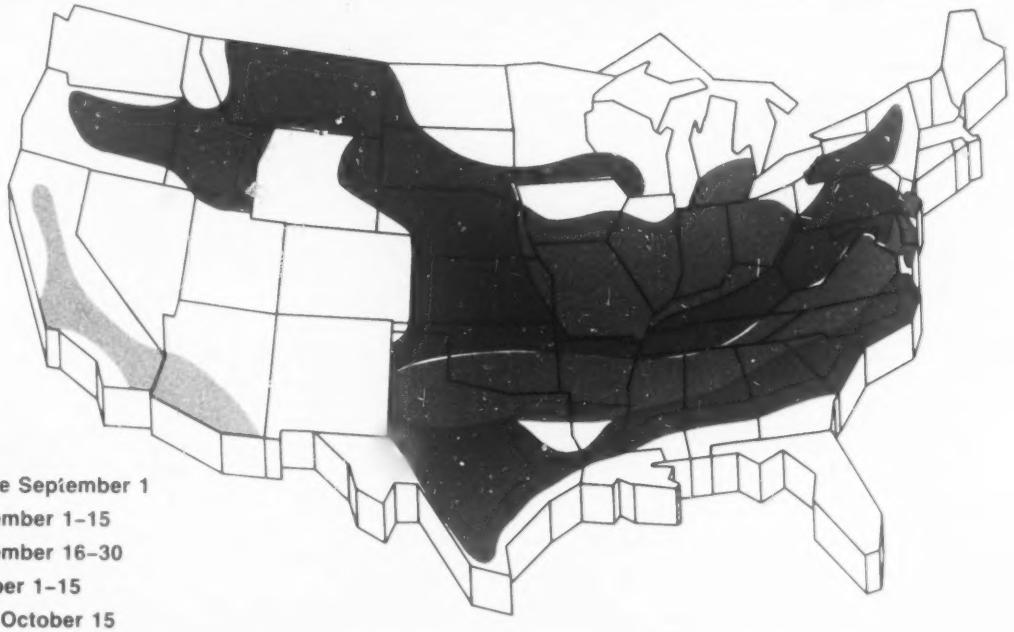


U.S. WHEAT GROWING REGIONS
Hard Red Winter

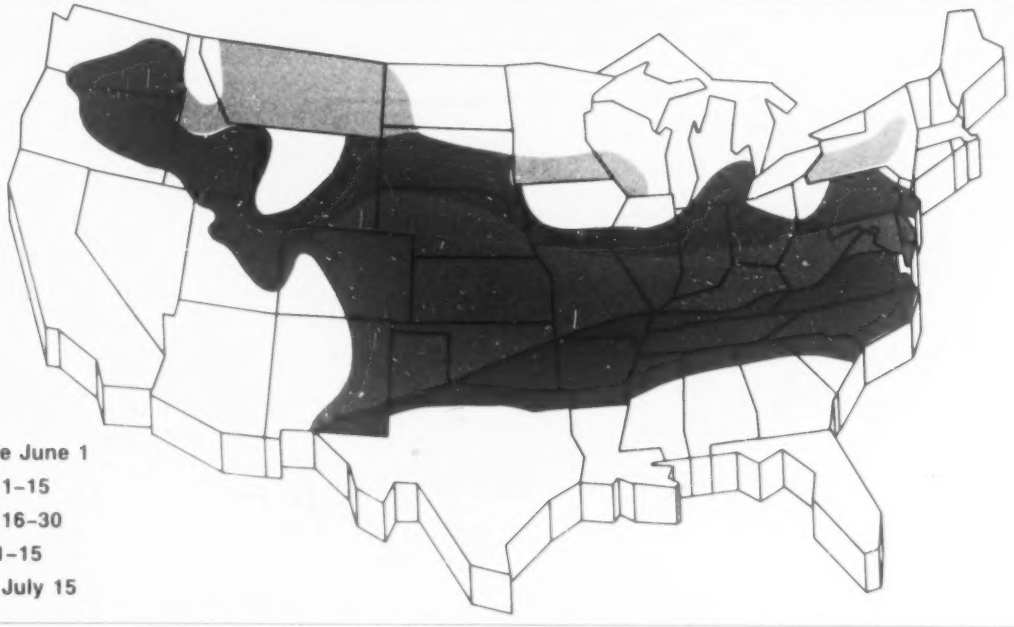


U.S. WHEAT GROWING REGIONS
Durum and Soft Red Winter

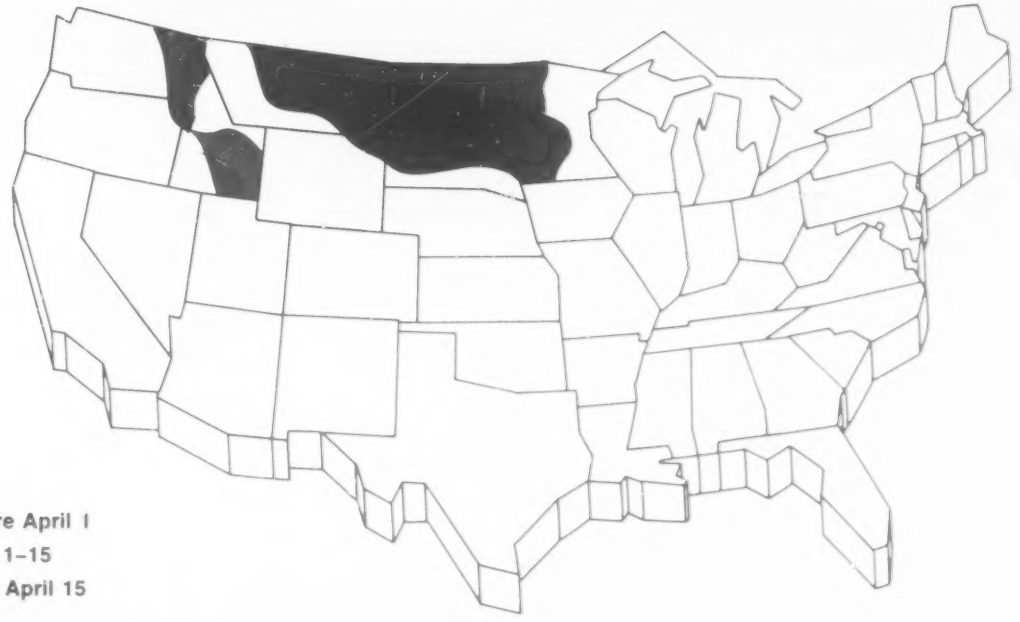
U.S. WINTER WHEAT
Usual Start of Planting



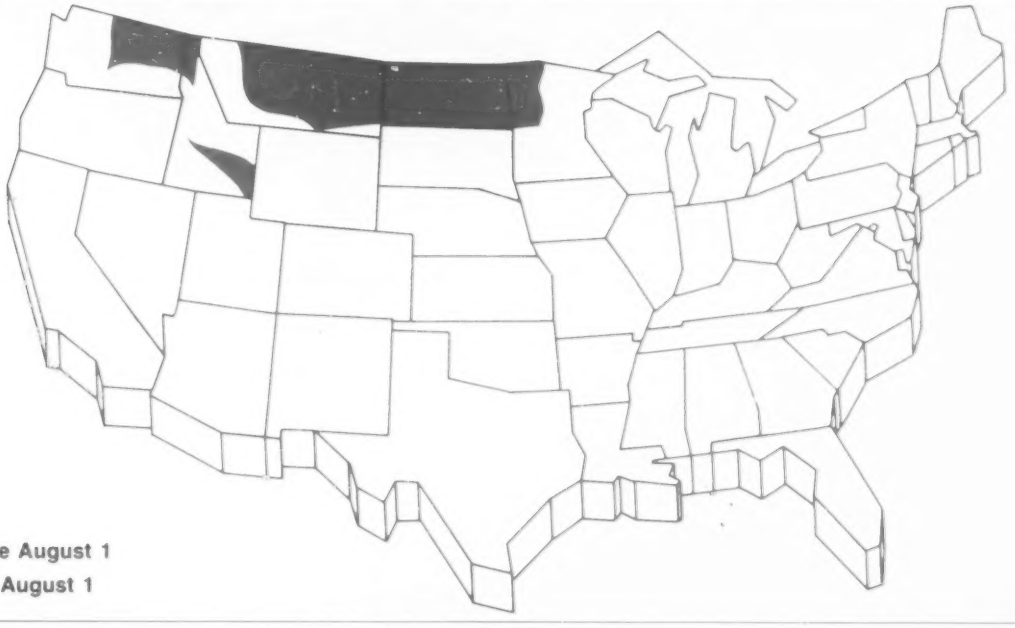
U.S. WINTER WHEAT
Usual Start of Harvesting



U.S. SPRING WHEAT
Usual Start of Planting



U.S. SPRING WHEAT
Usual Start of Harvesting



GRADES AND GRADE REQUIREMENTS FOR ALL CLASSES OF WHEAT
(EXCEPT MIXED)

	Minimum limits of—		Maximum limits of—						
	Test Weight per bushel							Wheat of other classes[4]	
	Hard Red Spring wheat or White Club wheat	All other classes and subclasses	Heat damaged kernels	Damaged kernels (total)[2]	Foreign material	Shrunken and broken kernels	Defects (total)[3]	Contrasting classes	Wheat of other classes[5]
	(pounds)[1]	(pounds)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
U.S. No. 1	58.0	60.0	0.2	2.0	0.5	3.0	3.0	1.0	3.0
U.S. No. 2	57.0	58.0	0.2	4.0	1.0	5.0	5.0	2.0	5.0
U.S. No. 3	55.0	56.0	0.5	7.0	2.0	8.0	8.0	3.0	10.0
U.S. No. 4	53.0	54.0	1.0	10.0	3.0	12.0	12.0	10.0	10.0
U.S. No. 5	50.0	51.0	3.0	15.0	5.0	20.0	20.0	10.0	10.0

U.S. Sample Grade . . . U.S. Sample Grade is wheat that:
(a) does not meet the requirements for the grades U.S. No. 1, 2, 3, 4, or 5; or
(b) contains 32 or more insect-damaged kernels per 100 grams of wheat; or
(c) contains 8 or more stones, 2 or more pieces of glass, 3 or more crotalaria seeds *(Crotalaria spp.)*, 2 or more castor beans *(Ricinus communis)*, 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), or 2 or more rodent pellets, bird droppings, or equivalent quantity of other animal filth per 1,000 grams of wheat; or
(d) has a musty, sour, or commercially objectionable foreign odor (except smut or garlic odor); or
(e) is heating or otherwise of distinctly low quality.

[1]These requirements also apply when Hard Red Spring wheat or White Club wheat predominate in a sample of Mixed wheat.
[2]Includes heat-damaged kernels.
[3]Defects (total) include damaged kernels (total), foreign material, and shrunken and broken kernels. The sum of these three factors may not exceed the limit for defects.
[4]Unclassed wheat of any grade may contain not more than 10 percent of wheat of other classes.
[5]Includes contrasting classes.

1988 CROP WHEAT SURVEY
(number of samples by wheat class and grade)

	Wheat class							
GRADE	DURUM	HARD RED SPRING	HARD RED WINTER	SOFT RED WINTER	WHITE	MIXED	UNCLAS-SIFIED	TOTAL
No. 1	1,066	1,147	2,271	447	1,566	11	4	6,512
No. 2	117	287	839	257	759	4	1	2,264
No. 3	74	132	336	125	189	3	—	859
No. 4	17	35	116	59	63	1	—	291
No. 5	4	10	58	25	18	—	—	115
Factor only	108	160	233	643	6	1	1	1,152
Sample	11	47	71	14	28	—	1	172
TOTAL	1,397	1,818	3,924	1,570	2,629	20	7	11,365

Source: Federal Grain Inspection Service

WHEAT PRODUCTION IN NAWG STATES, 1987–1989

	Area Harvested (1,000 acres)			Yield (bushels per acre)			Production (1,000 bushels)		
State	1987	1988	1989[1]	1987	1988	1989[1]	1987	1988	1989[1]
Arizona	89	85	118	89.9	90.9	91.0	8,005	7,730	10,722
Arkansas	840	1,070	1,250	41.0	53.0	44.0	34,440	56,710	55,000
California	567	519	675	77.4	84.4	80.0	43,890	43,785	53,745
Colorado	2,555	2,352	2,170	38.1	33.8	29.0	97,380	79,540	61,810
Idaho	1,140	1,150	1,370	75.0	65.7	69.0	85,500	75,520	94,280
Kansas	9,900	9,500	9,100	37.0	34.0	23.0	366,300	323,000	209,300
Minnesota	2,519	2,250	2,699	40.7	23.0	37.0	102,588	51,730	99,925
Montana	4,690	3,830	5,435	32.2	15.7	28.0	151,220	59,970	151,200
Nebraska	1,950	2,000	2,050	44.0	36.0	26.0	85,800	72,000	53,300
New Mexico	340	290	200	32.0	24.0	17.0	10,880	6,960	3,400
North Carolina	440	480	630	41.0	50.0	34.0	18,040	24,000	21,420
North Dakota	9,135	7,230	10,380	29.5	14.3	22.0	269,120	103,390	228,840
Oklahoma	4,800	4,800	5,700	27.0	36.0	27.0	129,600	172,800	153,900
Oregon	810	755	905	65.3	68.6	60.0	52,920	51,800	54,535
South Dakota	3,528	2,638	3,520	30.2	14.4	24.0	106,704	38,006	82,880
Texas	3,600	3,200	3,000	28.0	28.0	20.0	100,800	89,600	60,000
Washington	2,015	2,060	2,270	56.7	60.5	51.0	114,285	124,620	115,150
Wyoming	288	238	226	30.6	22.4	24.7	8,820	5,340	5,584
Total	49,206	44,447	51,648	36.3	31.2	29.3	1,786,292	1,386,501	1,514,991

[1]Indicated as of August 1, 1989.

U.S. WHEAT: SUPPLY AND USE, 1972–1989

Crop Year	Planted Acres (1,000)	Harvested Acres (1,000)	Yield (bu/a)	Production	Supply[1]	Domestic Food	Feed, Seed, Other	Exports	Total Use	Ending Stocks	Free Stocks	CCC Inventory	Farmer-Owned Reserve
				MILLION BUSHELS									
1972	54,913	47,303	32.7	1,546	2,531	532	267	1,135	1,934	597	591	6	11[2]
1973	59,254	54,148	31.6	1,711	2,311	544	209	1,217	1,971	340	340	1	—
1974	71,044	65,368	27.3	1,782	2,125	545	127	1,018	1,690	435	435	—	—
1975	74,900	69,499	30.6	2,127	2,564	589	137	1,173	1,898	666	666	—	—
1976	80,395	70,927	30.3	2,149	2,817	588	166	950	1,704	1,113	1,113	—	—
1977	75,410	66,686	30.7	2,046	3,161	587	273	1,124	1,983	1,178	788	48	342
1978	65,989	56,495	31.4	1,776	2,955	592	245	1,194	2,031	924	481	50	393
1979	71,424	62,454	34.2	2,134	3,060	596	187	1,375	2,158	902	454	188	260
1980	80,788	71,125	33.5	2,381	3,285	611	172	1,514	2,297	989	429	200	360
1981	88,251	80,642	34.5	2,785	3,777	602	245	1,771	2,618	1,159	407	190	562
1982	86,232	77,937	35.5	2,765	3,932	616	292	1,509	2,417	1,515	262	192	1,061
1983	76,419	61,390	39.4	2,420	3,939	643	469	1,429	2,540	1,399	600	188	611
1984	79,213	66,928	38.8	2,595	4,003	651	503	1,424	2,578	1,425	393	378	654
1985	75,575	64,734	37.5	2,425	3,866	683	363	915	1,961	1,905	870	602	433
1986	72,068	60,723	34.4	2,092	4,018	724	470	1,004	2,198	1,821	528	830	463
1987	65,804	55,930	37.7	2,107	3,945	719	373	1,592	2,684	1,261	511	283	467
1988[3]	65,917	52,941	34.1	1,811	3,096	720	258	1,425	2,403	694	217	190	287
1989[4]	76,757	62,677	32.6	2,044	2,759	730	280	1,275	2,285	474	224	100	150

[1]Includes beginning stocks, production and imports.
[2]The farmer-owned reserve program began in 1977. Prior to that, the reseal program was in effect.
[3]Preliminary.
[4]Projected.

U.S. WHEAT BY CLASSES: SUPPLY AND DISAPPEARANCE 1988/89–1989/90

(million bushels)

Year beginning June 1	Hard Winter	Hard Spring	Soft Red	White	Durum	Total
1988/89 Beginning stocks	567	402	75	134	83	1,261
Production	880	181	474	231	45	1,811
Supply, total[1]	1,447	590	548	369	141	3,096
Domestic use	515	174	189	39	61	978
Exports	635	200	320	250	20	1,425
Use, total	1,150	374	509	289	81	2,403
Ending stocks, total	297	216	40	81	60	694
1989/90 Beginning stocks	297	216	40	81	60	694
Production	716	432	561	245	91	2,044
Supply, total[1]	1,013	655	600	329	160	2,759
Domestic use	425	225	244	62	54	1,010
Exports	385	270	335	220	65	1,275
Use, total	810	495	579	282	119	2,285
Ending stocks, total	203	160	21	47	41	474

[1]Includes imports.

PRICES RECEIVED BY FARMERS, ALL WHEAT NAWG STATES, 1986–89

(dollars per bushel)

	Marketing Year			1989					
STATE	1986	1987	1988	Jan.	Feb.	March	April	May	June
Arizona	3.38	3.05	3.90	n/a	n/a	n/a	n/a	4.04	4.21
Arkansas	2.49	2.43	3.40	3.88	n/a	n/a	n/a	n/a	3.69
California	2.92	2.90	3.77	4.53	4.31	4.37	4.46	4.48	3.82
Colorado	2.26	2.51	3.79	3.74	3.96	4.03	4.08	4.04	4.01
Idaho	2.39	2.59	4.05	4.22	4.24	4.16	4.32	4.22	4.03
Kansas	2.25	2.43	3.60	3.91	3.94	4.02	4.05	3.96	3.90
Minnesota	2.43	2.57	3.81	3.87	3.83	4.02	3.88	4.01	3.96
Montana	2.52	2.74	3.97	4.01	4.02	4.08	4.13	4.06	4.10
Nebraska	2.23	2.45	3.70	3.87	3.93	4.04	4.04	4.13	3.92
New Mexico	2.25	2.28	3.25	n/a	n/a	n/a	n/a	n/a	n/a
North Carolina	2.50	2.55	3.40	n/a	n/a	n/a	n/a	n/a	n/a
North Dakota	2.54	2.95	4.15	3.88	4.01	4.03	3.86	3.93	3.79
Oklahoma	2.28	2.46	3.60	3.97	4.02	4.11	4.11	4.01	3.87
Oregon	2.59	2.86	4.35	4.67	4.63	4.56	4.48	4.40	4.23
South Dakota	2.42	2.60	3.73	3.75	3.85	3.94	3.94	3.96	3.90
Texas	2.32	2.36	3.40	3.88	3.81	3.98	3.90	3.99	3.82
Washington	2.51	2.82	4.25	4.56	4.57	4.39	4.42	4.33	4.14
Wyoming	2.22	2.50	3.66	n/a	n/a	n/a	n/a	n/a	n/a

ALL WHEAT: MONTHLY AVERAGE PRICES RECEIVED BY FARMERS 1979–1988

(dollars per bushel)

Crop Year	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	Average Wt'd.	Average Simple
1979	3.72	3.89	3.74	3.87	3.98	3.94	3.81	3.74	3.78	3.64	3.58	3.69	3.78	3.78
1980	3.69	3.81	3.94	3.99	4.19	4.32	4.22	4.21	4.17	4.09	4.07	3.95	3.91	4.06
1981	3.70	3.62	3.62	3.65	3.77	3.85	3.80	3.78	3.70	3.67	3.68	3.64	3.65	3.71
1982	3.39	3.26	3.34	3.38	3.43	3.48	3.51	3.57	3.57	3.66	3.75	3.75	3.55	3.51
1983	3.50	3.34	3.61	3.65	3.61	3.54	3.48	3.50	3.40	3.49	3.63	3.66	3.54	3.53
1984	3.45	3.29	3.42	3.43	3.43	3.46	3.38	3.38	3.38	3.38	3.43	3.28	3.38	3.39
1985	3.09	2.93	2.89	3.00	3.09	3.23	3.25	3.19	3.15	3.28	3.36	3.01	3.16	3.12
1986	2.48	2.25	2.26	2.28	2.30	2.43	2.49	2.53	2.58	2.58	2.63	2.66	2.42	2.46
1987	2.45	2.31	2.31	2.54	2.62	2.69	2.70	2.75	2.79	2.74	2.79	2.99	2.57	2.64
1988	3.37	3.50	3.61	3.82	3.84	3.88	3.94	4.02	4.30	4.07	4.03	4.01	3.72	3.87

WHEAT PROGRAM SUMMARY 1981–1990

Crop Year	Support/ Target Price ($/bushel)	Loan Rate ($/bushel)	Average Price to Farmers ($/bushel)	Number of Farms Participating	National Acreage Allotment/ Base (million a.)	Acreage Diversion Set Aside on Farms Participating (million a.)	Payments Diversion &SG&H[1] (million $)
1981	3.81	3.20/3.50	3.69	782,608	84.50[2]	none	none
1982	4.05	3.55/4.00	3.45	222,912	90.66[2]	5.80	none
1983	4.30	3.65	3.51	498,013	90.19	30.02	308.9
1984	4.38	3.30	3.39	317,565	93.96	18.45	506.1
1985	4.38	3.30	3.08	472,886	94.04	18.82	652.7
1986	4.38	2.40	2.42	456,725	91.60	21.01	215.0
1987	4.38	2.28	2.57	554,543	87.55	23.83	none
1988	4.23	2.21	3.72	551,262	85.27	22.81	none
1989	4.10	2.06	–	–	–	–	–
1990	4.00	1.95	–	–	–	–	–

[1]Special Grazing and Hay program.
[2]National program acreage.

K

Wheat Facts Sponsored by CIBA-GEIGY

THE KERNEL OF WHEAT...

The wheat kernel, sometimes called the wheat berry, is the seed from which the wheat plant grows. Each tiny seed contains three distinct parts that are separated during the milling process to produce flour. The kernel of wheat is a storehouse of nutrients essential to the human diet.

Endosperm

...about 83 percent of the kernel weight. It is the source of white flour. The endosperm contains the greatest share of the protein in the whole kernel, carbohydrates, iron as well as many B-complex vitamins, such as riboflavin, niacin, and thiamine.

Bran

...about 14½ percent of the kernel weight. Bran is included in whole wheat flour and is also available separately. Of the nutrients in whole wheat, the bran contains a small amount of protein, larger quantities of the B-complex vitamins listed above, trace minerals, and indigestible cellulose material also called dietary flour.

NUTRIENT COMPARISION OF SELECTED WHEAT FOODS

*100 Grams Edible Portion

Product	Calories	Protein grams	Fat grams	Carbohydrate grams
White Bread	267	8.28	3.92	48.82
Whole Wheat Bread	245	9.62	4.36	45.41
Cookie, Chocolate Chip	463	5.00	26.81	64.08
Doughnut	419	5.10	23.07	48.97
English Muffin	237	7.91	1.94	45.94
Crackers, Cheese	538	9.13	32.68	51.95
Pasta, dry	(368)	12.80	1.60	75.10

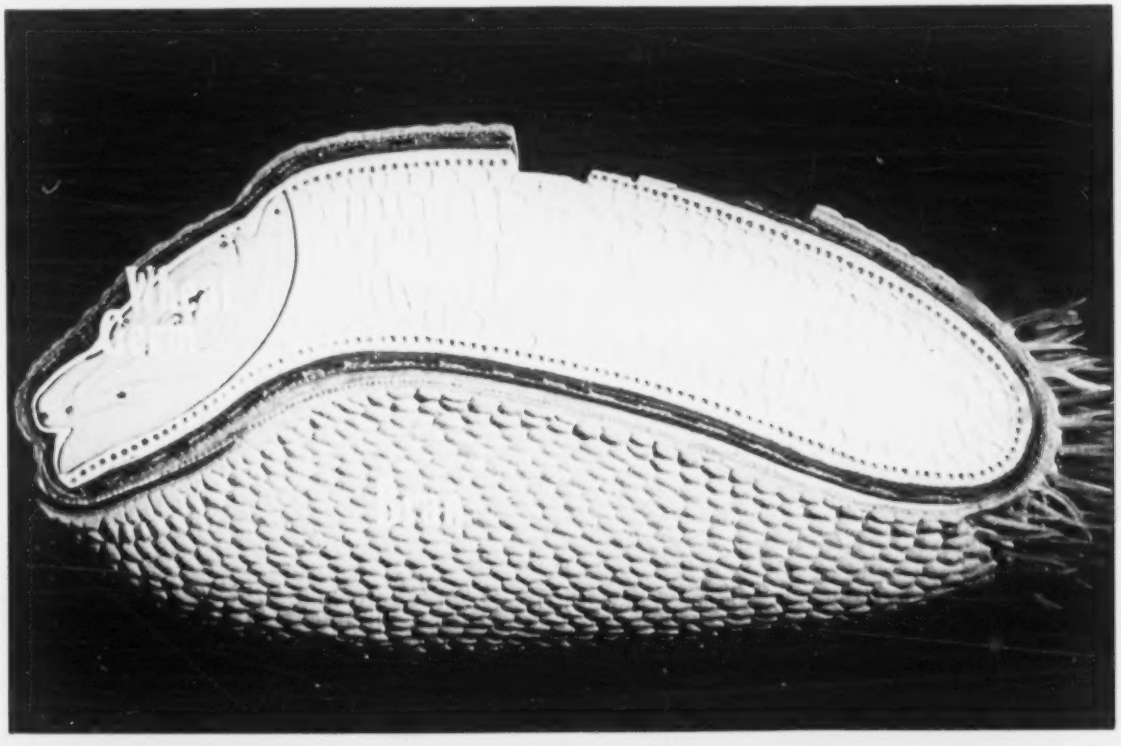
*100 grams equal 3.5 ounces

Parentheses ( ) denote calculated values U.S.D.A. Human Nutrition Services

Germ

...about 2½ percent of the kernel weight. The germ is the embryo or sprouting section of the seed, usually separated because of the fat that limits the keeping quality of flour. Of the nutrients in whole wheat, the germ contains minimal quantities of protein, but a greater share of B-complex vitamins and trace minerals. Wheat germ can be purchased separately and is included in whole wheat flour.

Courtesy Wheat Foods Council.



WHEAT NUTRIENTS

Wheat foods are an essential part of a balanced diet because they provide good nutritional value for their caloric cost. Following are the basic nutritional components of wheat foods:

CARBOHYDRATE

Complex Carbohydrate—Wheat flour is a good source of complex carbohydrate, the most efficient source of energy available to the human body. Unlike simple carbohydrates, such as sugars, which are quickly absorbed into the blood stream, complex carbohydrate provides a steady source of fuel because it is released slowly.

Fiber—Fiber is the undigestible carbohydrate in food which acts like a broom to sweep out the digestive tract. Adequate fiber intake has been related to a lower incidence of cancer of the colon and some types of heart disease and to better control diabetes. One slice of whole wheat bread contains 1.5 grams of dietary fiber; one slice of white bread contains 0.5 grams.

PROTEIN

Wheat foods are moderate sources of incomplete protein. This means that while wheat and other cereal grains may contain all eight of the amino acids necessary for good health, not all eight are found at adequate levels. However, combining wheat or other cereal grains with animal proteins or legumes makes the grain protein complete. Within the cereal group, wheat contains more protein than rice or corn.

FAT

Fats account for 2 to 23 percent of wheat foods, although wheat alone contains very little fat. Most often, the fat content in wheat foods results from fat added in production, such as the oil or shortening found in many baked or fried wheat foods. Bread and pasta products are low-fat foods because the major ingredient, by weight, is wheat flour.

OTHER VITAMINS AND MINERALS

Thiamine—One of the essential B-vitamins needed daily for good appetite, digestion and healthy nerves. Thiamine helps the body make better use of fat and carbohydrate. Wheat foods are a good source of thiamine.

Niacin—A B-vitamin essential for the efficient use of protein by the body. Wheat foods are a good source of niacin.

Iron—Vital to nutrition. Combines with protein to form hemoglobin, a compound in red blood cells that carries oxygen from the lungs to each cell in the body while it carries away carbon dioxide. Wheat foods are a reliable source of iron for normal dietary needs.

Zinc—Important for skin healing and growth properties. Wheat foods are a good source of zinc.

Riboflavin—Essential for growth and good vision. Helps the body make use of carbohydrate, fat and protein. Wheat foods are a fair source of riboflavin.

Trace Minerals—Wheat foods are a good source of selenium and magnesium, nutrients essential to good health.

Courtesy Wheat Foods Council

WHEAT FLOURS

ALL-PURPOSE FLOUR

All-purpose flour is the finely ground endosperm of the wheat kernel separated from the bran and germ during the milling process. All-purpose flour is made from hard wheats or a combination of soft and hard wheat from which the home baker can make a complete range of satisfactory baked products such as yeast breads, cakes, cookies, pastries and noodles.

Enriched All-Purpose Flour has iron and B-vitamins added in amounts equal to or exceeding that of whole wheat flour.

Bleached Enriched All-Purpose Flour is treated with chlorine to mature the flour, condition the gluten and improve the baking quality. The chlorine evaporates and does not destroy the nutrients but does reduce the risk of spoilage or contamination.

Unbleached Enriched All-Purpose Flour is bleached by oxygen in the air during an aging process and is off-white in color. Nutritionally, bleached and unbleached flour are the same.

BREAD FLOUR

Bread flour, from the endosperm of the wheat kernel, is milled primarily for commercial bakers but is also available at retail outlets. Although similar to all-purpose flour, it has a greater gluten strength and generally is used for yeast breads.

SELF-RISING FLOUR

Self-rising flour is an all-purpose flour with salt and leavening added. One cup of self-rising flour contains 1-1/2 teaspoons baking powder and 1/2 teaspoon salt. Self-rising flour can be substituted for all-purpose flour in a recipe by reducing salt and baking powder according to those proportions.

WHOLE WHEAT FLOUR

Whole wheat flour is a coarse-textured flour ground from the entire wheat kernel and thus contains the bran, germ and endosperm. The presence of bran reduces gluten development. Baked products made from whole wheat flour tend to be heavier and denser than those made from white flour.

OTHER FLOURS

Cake Flour—Milled from soft wheat. Especially suitable for cakes, cookies, crackers and pastries. Low in protein and gluten.

Pastry Flour—Milled from a soft, low gluten wheat. Comparable in protein but lower in starch than cake flour.

Gluten Flour—Used by bakers in combination with flours having a low protein content because it improves the baking quality and produces gluten bread of high protein content.

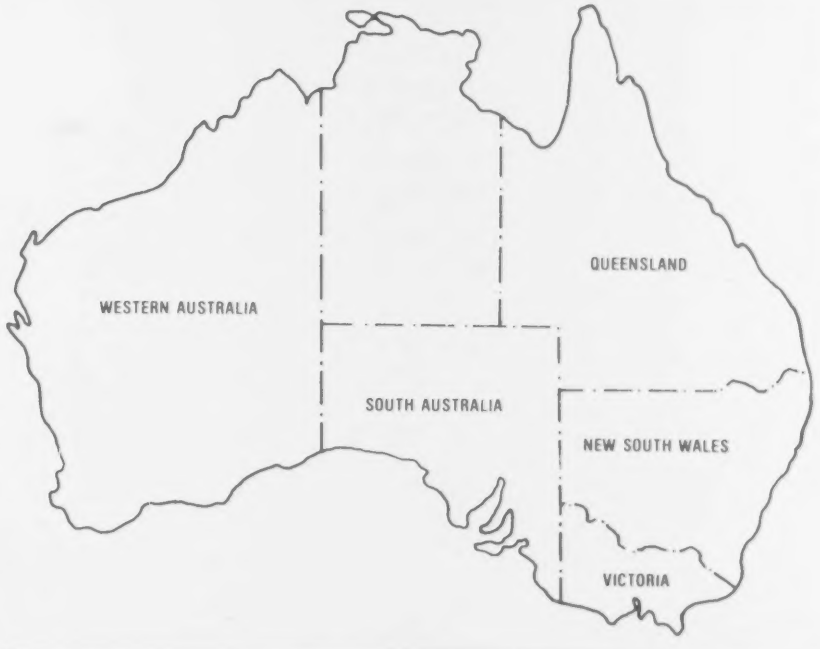
Semolina—Coarsely ground endosperm of durum wheat. High in protein. Used in high quality pasta products.

Durum Flour—By-product of semolina production. Used to make commercial U.S. noodles.

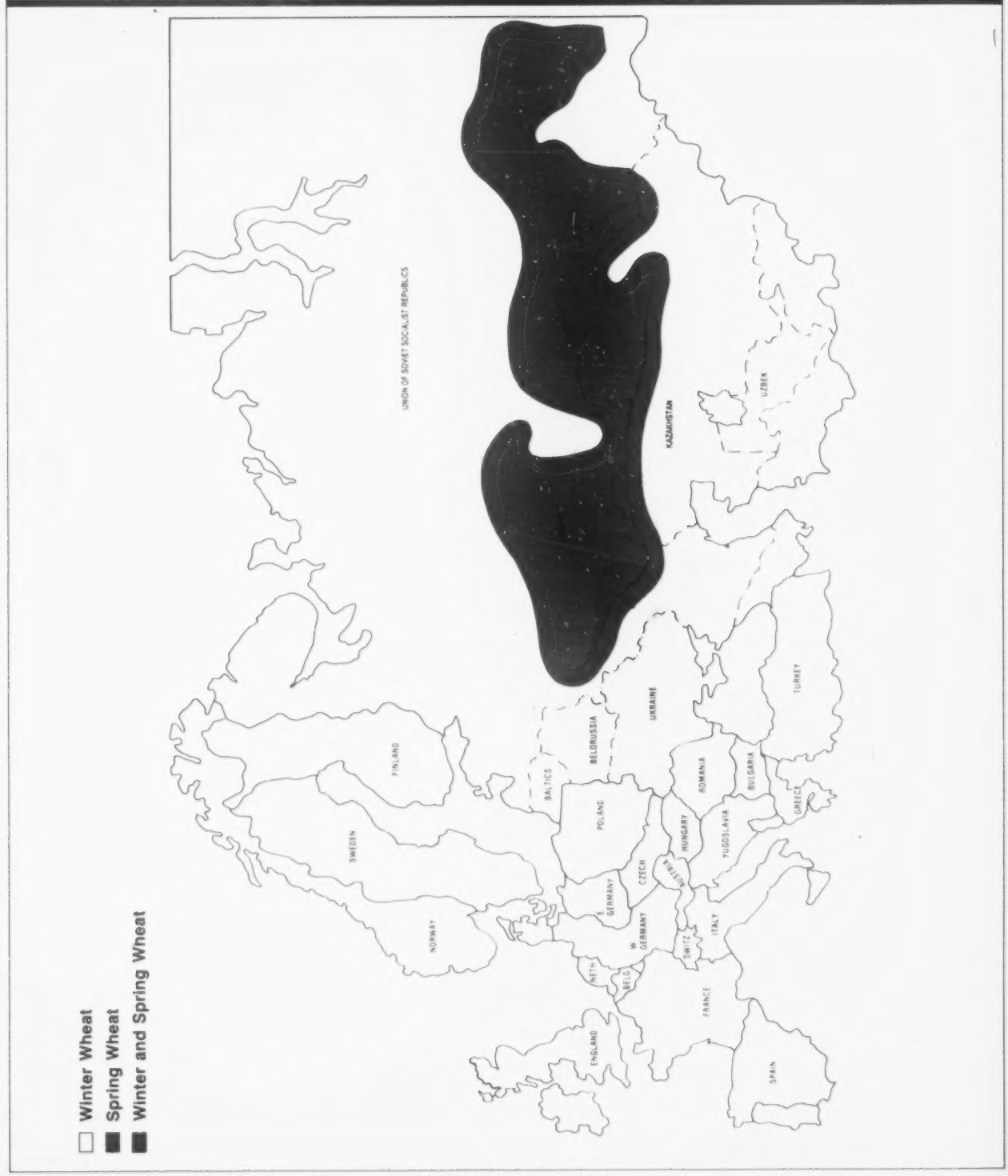
Farina—Coarsely ground endosperm of hard wheats. Prime ingredient in many U.S. breakfast cereals. Also used in the production of inexpensive pasta.

CANADIAN WHEAT GROWING REGIONS

AUSTRALIAN WHEAT GROWING REGIONS



EUROPEAN AND SOVIET WHEAT GROWING REGIONS, BY CLASS



U.S. WHEAT EXPORTS BY DESTINATION, 1985/86–1988/89

Ranked in Descending Order for Marketing Year 1988/89 Compared with the Four Previous Marketing Years (1,000 metric tons)

Country	1988/89 Quantity	1988/89 Rank	1987/88 Quantity	1987/88 Rank	1986/87 Quantity	1986/87 Rank	1985/86 Quantity	1985/86 Rank
China	8,094	1	3,856	2	61	50	581	13
USSR	4,959	2	12,275	1	–	–	153	29
Egypt	2,981	3	2,514	4	2,556	2	1,491	3
Japan	2,861	4	3,236	3	3,317	1	3,236	1
India	2,015	5	–	–	–	–	–	–
Korea	1,798	6	2,095	5	1,777	3	1,955	2
Pakistan	1,613	7	198	26	74	48	851	7
Philippines	1,173	8	567	13	713	10	685	9
Algeria	1,132	9	1,991	6	1729	4	1,247	4
Mexico	1,052	10	228	25	87	44	–	–
Morocco	933	11	1,874	7	1,428	5	1,099	5
Bangladesh	834	12	780	11	438	18	228	25
Taiwan	831	13	872	10	816	7	657	11
Iraq	679	14	1,068	9	727	9	662	10
Venezuela	530	15	419	16	891	6	612	12
Sri Lanka	507	16	367	17	397	19	190	26
Israel	458	17	494	14	538	15	470	16
Peru	437	18	190	27	222	24	153	28
Colombia	406	19	315	20	276	21	498	15
Ecuador	373	20	340	19	332	20	392	19
Tunisia	345	21	593	12	620	12	62	46
Italy	342	22	357	18	521	16	365	21
Dominican Republic	186	23	22	58	166	29	232	24
Guatemala	157	24	139	32	107	38	151	30
Costa Rica	154	25	109	40	105	41	136	32
Haiti	149	26	114	37	97	42	119	34
Indonesia	146	27	231	23	441	17	259	23
Jordan	142	28	233	22	151	33	184	27
Portugal	142	29	111	39	128	35	505	14
Thailand	128	30	119	35	84	45	77	43
Belgium	126	31	134	34	113	37	69	45
Bolivia	123	32	181	28	172	27	114	35
Zaire	122	33	149	31	154	31	110	37
Netherlands	113	34	62	50	197	25	372	20
Hong Kong	109	35	115	36	107	40	106	38
Yemen (Sana)	104	36	230	24	180	26	30	52
Jamaica	99	37	138	33	152	32	146	31
Honduras	95	38	88	42	107	39	78	42
El Salvador	89	39	154	29	141	34	126	33
Panama	86	40	78	45	93	43	84	39
Finland	76	41	95	41	23	61	56	47
Sudan	75	42	437	15	263	22	341	22
Trinidad	72	43	80	44	116	36	110	36
Kenya	60	44	112	38	69	49	82	40
Turkey	51	45	72	46	224	23	459	18

WHEAT INSPECTED FOR EXPORT BY CLASS, REGION AND PORT AREA

June 1988–May 1989 (1,000 bushels)

Port Area	Hard Red Spring	Hard Red Winter	Soft Red Winter	White	Durum	Mixed	Total
St. Lawrence Seaway	9,799	0	8,520	0	3,237	0	21,556
Lakes (Overseas)							
Duluth-Superior Area	38,744	588	765	0	9,866	0	49,963
Toledo Area	0	0	9,659	0	0	0	9,659
Subtotal	38,744	588	10,424	8	9,866	0	59,630
Atlantic							
North	160	0	955	0	0	0	1,115
South	502	0	54,444	3,177	0	0	58,123
Subtotal	662	0	55,399	0	0	0	59,238
Gulf							
Mississippi River	48,360	20,378	230,317	0	3,549	101	302,705
East Gulf	45	135	6,673	0	0	0	6,853
N. Texas Gulf	3,398	471,457	8,024	0	2,497	300	485,676
S. Texas Gulf	0	11,257	122	0	0	0	11,379
Subtotal	51,803	503,227	245,136	0	6,046	401	806,613
Pacific							
Columbia River	97,545	94,479	19	245,199	526	0	437,768
Puget Sound	0	1,194	0	11,769	0	0	12,963
California	0	18,488	0	0	283	0	18,771
Subtotal	97,545	114,161	19	256,967	809	0	469,502
Interior	0	8,332	0	0	0	0	8,332
Totals							
June 88–May 89	198,553	626,308	319,498	260,153	19,958	401	1,424,871
June 87–May 88	256,148	879,004	153,373	213,672	58,245	5,459	1,563,901

Wheat shipped for storage in Canada is reported at the time of shipment from St. Lawrence Seaway ports.

WORLD WHEAT PRODUCTION, CONSUMPTION, MAJOR IMPORTERS[1]

1987/88–1989/90 (million metric tons)

Country	1989/90[2] Prod.	1989/90[2] Cons.	1989/90[2] Imports	1988/89[3] Prod.	1988/89[3] Cons.	1988/89[3] Imports	1987/88 Prod.	1987/88 Cons.	1987/88 Imports
China	91.0	107.0	16.00	86.4	104.9	16.00	85.8	102.8	15.00
USSR	91.5	102.5	12.00	84.4	99.9	15.00	83.3	101.5	21.50
Egypt	3.0	9.9	6.40	2.8	9.4	6.40	2.4	8.8	6.43
Japan	.9	5.9	5.10	1.0	5.9	5.20	.9	6.2	5.65
Algeria	1.1	5.4	4.30	1.2	5.5	4.30	1.2	5.0	3.80
Iran	6.3	9.6	3.33	6.8	9.8	3.00	6.0	5.6	4.00
South Korea	0	3.0	3.00	0	3.0	2.80	0	4.4	4.46
Iraq	.8	1.0	2.90	1.0	1.2	2.90	.7	.9	2.70
Bangladesh	.8	3.1	2.10	1.0	3.1	2.20	1.1	3.1	2.33
Brazil	4.5	7.5	2.00	5.8	8.0	1.00	6.1	7.1	2.00
Indonesia	0	1.7	1.75	0	1.6	1.50	0	1.6	1.60
Cuba	0	1.4	1.40	0	1.4	1.40	0	1.4	1.40
Morocco	3.8	5.3	1.40	4.0	5.2	1.30	2.4	4.5	1.90
Pakistan	14.3	15.9	1.40	12.7	14.9	2.20	12.0	13.8	.60
Philippines	0	1.3	1.30	0	1.2	1.20	0	1.1	1.08
Tunisia	0.3	1.6	1.30	0.2	1.7	1.10	1.36	1.8	8.50
Total World	533.4	538.1	97.42	501.0	534.3	98.15	503.7	533.5	105.45

[1]Trade on July–June years; production and consumption on local crop year. [2]Forecast [3]Preliminary

WHEAT SUPPLY AND DISAPPEARANCE: MAJOR EXPORTERS

1984/85–1989/90
(million metric tons/hectares)

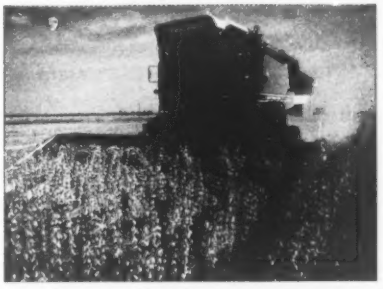
	Area Harvested	Yield (mt/ha)	Production	Domestic Use	Exports[1] July/June	Exports[1] Mkt. Year	Percent of World Trade	Exports as Percent of Production	Mkt. Year Ending Stocks
ARGENTINA (Marketing Year December/November)									
1984/85	6.0	2.22	13.2	4.6	8.0	9.4	7.5	60.6	0.5
1985/86	5.3	1.61	8.5	4.4	6.1	4.3	7.2	71.8	0.3
1986/87	5.0	1.79	8.9	4.5	4.3	4.4	4.7	48.3	0.2
1987/88	4.8	1.84	8.8	4.6	3.7	3.7	3.5	42.1	0.7
1988/89[2]	4.5	1.75	7.8	4.6	3.5	3.7	3.5	44.9	0.2
1989/90[3]	5.5	1.91	10.5	4.6	5.7	5.8	5.8	54.3	0.3
AUSTRALIA (Marketing Year October/September)									
1984/85	12.1	1.55	18.7	2.9	15.8	14.7	14.8	84.5	8.6
1985/86	11.7	1.38	16.2	2.9	16.0	16.0	18.8	98.8	5.9
1986/87	11.1	1.45	16.1	2.6	14.8	15.6	16.3	91.9	3.8
1987/88	9.1	1.37	12.4	3.6	12.2	9.9	11.6	98.4	2.8
1988/89[2]	8.9	1.62	14.5	3.5	10.7	11.1	10.8	73.8	2.7
1989/90[3]	9.5	1.51	14.3	3.5	11.0	10.8	11.1	76.9	2.7
CANADA (Marketing Year August/July)									
1984/85	13.2	1.61	21.2	5.2	19.4	17.5	18.1	91.5	7.6
1985/86	13.7	1.77	24.3	5.6	16.8	17.7	19.8	69.1	8.6
1986/87	14.2	2.20	31.4	6.4	20.8	20.8	22.9	66.2	12.7
1987/88	13.5	1.93	26.0	7.8	23.6	23.5	22.4	90.8	7.3
1988/89[2]	12.9	1.21	15.7	5.1	13.5	12.2	13.7	86.0	5.7
1989/90[3]	13.5	1.93	26.0	6.0	20.0	20.0	20.2	76.9	5.7
EUROPEAN COMMUNITY (Marketing Year July/June)									
1984/85	16.2	5.13	83.1	60.1	18.5[4]	28.4	17.3	22.3	16.4
1985/86	15.3	4.68	71.6	59.3	15.6[4]	27.8	18.4	21.8	16.3
1986/87	15.7	4.58	72.0	56.7	16.4[4]	28.0	18.1	22.8	17.1
1987/88	15.9	4.49	71.4	58.3	15.3[4]	28.4	14.5	21.4	15.3
1988/89[2]	15.5	4.81	74.7	60.1	21.0[4]	30.6	21.3	28.1	12.4
1989/90[3]	16.3	4.76	77.6	60.5	21.0[4]	31.2	21.2	27.6	11.9
UNITED STATES (Marketing Year June/May)									
1984/85	27.1	2.61	70.6	31.4	38.1	38.8	35.6	54.0	38.8
1985/86	26.2	2.52	66.0	28.5	25.0	24.9	29.4	37.9	51.8
1986/87	24.6	2.32	56.9	32.5	28.4	27.3	31.3	49.9	49.6
1987/88	22.6	2.53	57.4	29.7	43.4	43.3	41.1	79.1	34.3
1988/89[2]	21.5	2.29	49.3	26.2	39.0	39.2	39.5	79.1	18.9
1989/90[3]	25.7	2.24	57.6	27.6	33.5	33.3	33.8	58.2	16.1

[1]Includes the wheat equivalent of flour.
[2]Preliminary.
[3]Projected.
[4]Excludes Intra-EC trade.

WHEAT: WEIGHTS, MEASURES AND CONVERSION FACTORS

Bushel Weights:

1 bu. wheat/soybeans	= 60 lbs.
1 bu. corn/sorghum	= 56 lbs.
1 bu. barley	= 48 lbs.
1 bu. oats	= 32 lbs.

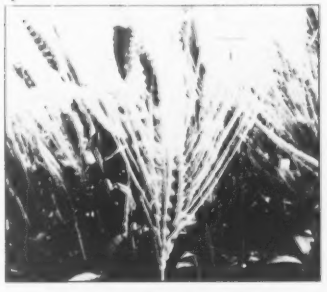


1 Bushel of Wheat Equals:

0.030	short tons
0.0272155	metric tons
0.0267857	long tons
27.21555	kilograms

Bushels to Metric Tons:

Wheat/soybeans	= bu.	×	0.027216
Corn/sorghum	= bu.	×	0.025400
Barley	= bu.	×	0.021772
Oats	= bu.	×	0.014515



Wheat Flour Equivalents

1 metric ton wheat flour	= 1.38 metric ton wheat
100 pounds	= 2.3 bushels
43.5 pounds	= 1 bushel
1 barrel wheat flour	= 196 pounds
4.51 bushels	= 1 barrel of flour

1 Metric Ton Equals

2,204.622	pounds
1,000	kilograms
36.74371	bu. of wheat or soybeans
39.3679	bu. of corn or sorghum
45.9296	bu. of barley
68.8944	bu. of oats
22.046	hundredweight
10	quintals

Acreage Equivalents

1 hectare	= 2.4710 acres
1 sq. mile	= 640 acres (259 hectares)
1 acre	= 0.404694 hectares = 4,840 sq. yards = .9 football fields, excluding end zones.

Test Weight

pounds/bushel × 1.2872 = kilograms/hectalitre

Yield Equivalents

Wheat: bu./acre x 0.6725	= metric tons/hectare
Corn: bu./acre x .06277	= metric tons/hectare
Barley: bu/acre x .05380	= metric tons/hectare
Oats: bu./acre x .03587	= metric tons/hectare